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CONVERSION OF COMPUTER SOFTWARE FOR THE GIMBALLED ELECTROSTATIC--ETC(U)
FEB 77 W MIKULSKI, W E SHEPHARD

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1 OF 3
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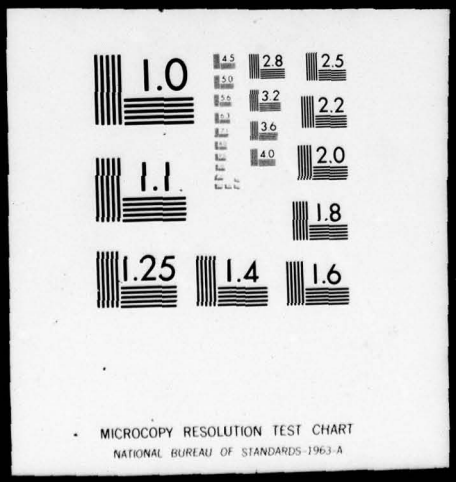

AFAL-TR-77-8
Volume II

CONVERSION OF COMPUTER SOFTWARE FOR THE GIMBALLED ELECTROSTATIC GYRO NAVIGATION SYSTEM

Volume II
SKC-2000 COMPUTER LISTING

REFERENCE SYSTEMS BRANCH
RECONNAISSANCE AND WEAPON DELIVERY DIVISION

FEBRUARY 1977

TECHNICAL REPORT AFAL-TR-77-8, Volume II
FINAL REPORT FOR PERIOD MAY 1973 - DECEMBER 1975

AIR FORCE AVIONICS LABORATORY
AIR FORCE WRIGHT AERONAUTICAL LABORATORIES
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number):

The Gimballed Electrostatic Gyro Navigation System (GEANS) conversion effort consisted of the conversion of an assembly language program for the Honeywell HDC-601 computer to another assembly language program for the Singer/Kearfott SKC-2000 computer. The HDC-601 and SKC-2000 were run in real time simultaneously. The SKC-2000 real time executive automatically synchronized with the HDC-601 so both programs ran in parallel, using the same input data from the Inertial Measurement Unit (IUM). Alignment and Navigation output of

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20. ABSTRACT (Cont'd)

both programs could then be compared and the SKC-2000 output verified. The conversion was completed successfully, the HDC-601 and SKC-2000 outputs agreeing to about 0.015 nautical miles per hour.

```
VERSION K20A0503      DECK NAME=*NAV   *                                                                          PAGE   1

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
                                  $FAP NAV
             1 05100  20736 -2    BUFORG   SETX   5100          DATA BUFFER ORIGON
                                  *
                                  *    THIS SETS UP A BUFFER AREA AROUND INTERRUPT TRAP AND RETURN AREA
                                  *    7FA0 TO 7FFE
                                  *
             2                0            USE    0
             3                0            ORG    32672
             4 07FA0  32672   0            BSS    96
                                  *
                                  *    GEANS WORLD COMMON VARIABLES DATA AREA
                                  *
             5                4   WLDCOM   COMMON  4
                                  *
             6 00000      0   4   SRT1     BSS    4             GYRO ROTOR 1 SPEED ACCUMULATION
             7 00004      4   4   SRT2     BSS    4             GYRO ROTOR 2 SPEED ACCUMULATION
             8 00008      8   4   RATM     BSS    4             NEGATIVE R.A.T. PULSE ACCUMULATION
             9 0000C     12   4   RATP     BSS    4             POSITIVE R.A.T. PULSE ACCUMULATION
            10 00010     16   4   ROT1     BSS    2             GYRO 1 ROTOR SPEED ( REV/SECOND )
            11 00012     18   4   ROT2     BSS    2             GYRO 2 ROTOR SPEED ( REV/SECOND )
            12 00014     20   4   DVXG     BSS    4             ACCUMULATED DELT VX
            13 00018     24   4   DVYG     BSS    4             ACCUMULATED DELT VY
            14 0001C     28   4   DVZG     BSS    4             ACCUMULATED DELT VZ
            15 00020     32   4   DPVV     BSS    4             DOPPLER VERTICAL VELOCITY ACCUMULATION
            16 00024     36   4   DPDV     BSS    4             DOPPLER DRIFT    VELOCITY ACCUMULATION
            17 00028     40   4   DPHV     BSS    4             DOPPLER HEADING  VELOCITY ACCUMULATION
            18 0002C     44   4   GMT      BSS    4             GREENWICH MEAN TIME
            19 00030     48   4   BTE1     BSS    2             BITE ACTUAL STATE MASK WORD 1
            20 00032     50   4   BTE3     BSS    2             BITE ACTUAL STATE MASK WORD 3
            21 00034     52   4   R1CT     BSS    2             COUNTER FOR ROTOR 1 SPEED FAULT
            22 00036     54   4   R2CT     BSS    2             COUNTER FOR ROTOR 2 SPEED FAULT
            23 00038     56   4   CIPM     BSS    2             INPUT POWER MONITOR COUNTER
            24 0003A     58   4   RAT      BSS    2             REDUNDANT AXIS TORQUING (PULSES)
            25 0003C     60   4   RATL     BSS    2             COUNTER FOR RAT
            26 0003E     62   4   DVX      BSS    4             INPUT DELTA VX
            27 00042     66   4   DVY      BSS    4             INPUT DELTA VY
            28 00046     70   4   DVZ      BSS    4             INPUT DELTA VZ
            29 0004A     74   4   CYLE     BSS    2             OUT-OF-TIME FLAG
            30 0004C     76   4   VRTV     BSS    2             DOPPLER VERTICAL VELOCITY
            31 0004E     78   4   DRFV     BSS    2             DOPPLER DRIFT    VELOCITY
            32 00050     80   4   HDGV     BSS    2             DOPPLER HEADING  VELOCITY
            33 00052     82   4   CTR1     BSS    2             PHASE TIMER
            34 00054     84   4   CTR2     BSS    2             INTERNAL SEQUENCING COUNTER
            35 00056     86   4   CTR3     BSS    2             INTERNAL SEQUENCING COUNTER
            36 00058     88   4   TIME     BSS    4             TIME FROM SYSTEM TURN ON (SECONDS)
            37 0005C     92   4   T0       BSS    4             TIME AT ENTRY TO NAV
            38 00060     96   4   ITER     BSS    2             ITERATION COUNTER
            39 00062     98   4   PHAS     BSS    2             AUTOMATIC SEQUENCING PHASE
            40 00064    100   4   NAVF     BSS    2             IN-NAVIGATION MODE FLAG (2/3 - MAN/AUTO)
            41 00066    102   4   DATA     BSS    2             SYSTEM DATA SWITCH (0-7)
            42 00068    104   4   PUSH     BSS    2             PUSHBUTTON SWITCH (0-31)
            43 0006A    106   4   TEST     BSS    2             PRESS TO TEST SWITCH (0/-1)
            44 0006C    108   4   MODE     BSS    2             SYSTEM MODE SWITCH
            45 0006E    110   4   LITE     BSS    2             CDU LIGHTS (SOFTWARE)
            46 00070    112   4   TMPR     BSS    2             TEMP STORAGE LOCATION
```

VERSION K20A0503 DECK NAME=*NAV *

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM				SOURCE
				*				
				* SOUL DATA AREA				
				*				
47	00072	114	4	04F	BSS	2	01	FRAME MARKER
48	00074	116	4	040	BSS	2	02	MSH OF GMT
49	00076	118	4	041	BSS	2	03	LSH OF GMT
50	00078	120	4	042	BSS	2	04	MSH OF LATITUDE
51	0007A	122	4	043	BSS	2	05	LSH OF LATITUDE
52	0007C	124	4	044	BSS	2	06	MSH OF LONGITUDE
53	0007E	126	4	045	BSS	2	07	LSH OF LONGITUDE
54	00080	128	4	047	BSS	2	08	MSH OF VERTICAL VELOCITY
55	00082	130	4	048	BSS	2	09	LSH OF VERTICAL VELOCITY
56	00084	132	4	049	BSS	2	10	MSH OF EAST VELOCITY
57	00086	134	4	04A	BSS	2	11	LSH OF EAST VELOCITY
58	00088	136	4	04B	BSS	2	12	MSH OF NORTH VELOCITY
59	0008A	138	4	04C	BSS	2	13	LSH OF NORTH VELOCITY
60	0008C	140	4	046	BSS	2	14	I.N.S. ALTITUDE
61	0008E	142	4	06C	BSS	2	15	AHRS HEADING
62	00090	144	4	06D	BSS	2	16	AHRS PITCH
63	00092	146	4	06E	BSS	2	17	AHRS ROLL
64	00094	148	4	018	BSS	2	18	RESET,IMU,OPU,EAU,CDU,DCU,BATT BITE BITS
65	00096	150	4	030	BSS	2	19	3RD,4TH,5TH,6TH, RIGHT NUMERIC
66	00098	152	4	031	BSS	2	20	4 DISCRETES; R.ALPHA; 1ST,2ND R. NUMERIC
67	0009A	154	4	032	BSS	2	21	2ND,3RD,4TH,5TH LEFT NUMERIC
68	0009C	156	4	033	BSS	2	22	1ST,2ND WAYPOINT; L. ALPHA; 1ST L.NUMERIC
69	0009E	158	4	034	BSS	2	23	1ST,2ND FROM< 1ST,2ND TO
70	000A0	160	4	035	BSS	2	24	CDU/ACDU DISPLAY LIGHTS
71	000A2	162	4	023	BSS	2	25	HEADING
72	000A4	164	4	021	BSS	2	26	PITCH
73	000A6	166	4	022	BSS	2	27	ROLL
74	000A8	168	4	024	BSS	2	28	STEERING SIGNAL
75	000AA	170	4		BSS	2	29	BLANK
76	000AC	172	4	014	BSS	2	30	SEQ CNT,G1,2 RED,G1,2 TERM SHUTDOWN BITS
77	000AE	174	4	072	BSS	2	31	TORQUE FOR GIMBALS 1 AND 2
78	000B0	176	4	071	BSS	2	32	TORQUE FOR GIMBALS 3 AND 4
79	000B2	178	4	04D	BSS	2	33	ROTOR 1,2, ROTOR SPEED
80	000B4	180	4	04E	BSS	2	34	RAT AND VERTICAL VELOCITY
81	000B6	182	4	050	BSS	2	35	-,+ DELTA VX
82	000B8	184	4	051	BSS	2	36	-,+ DELTA VY
83	000BA	186	4	052	BSS	2	37	-,+ DELTA VZ
84	000BC	188	4	053	BSS	2	38	GIMBAL 1 RESOLVER
85	000BE	190	4	054	BSS	2	39	GIMBAL 2 RESOLVER
86	000C0	192	4	055	BSS	2	40	GIMBAL 3 RESOLVER
87	000C2	194	4	056	BSS	2	41	GIMBAL 4 RESOLVER
88	000C4	196	4	058	BSS	2	42	DATA,MODE,TST AND PUSHBUTTON SWITCHES
89	000C6	198	4	05D	BSS	2	43	BITE BITS
90	000C8	200	4	05E	BSS	2	44	BITE BITS
91	000CA	202	4	025	BSS	2	45	BAROMETRIC ALTITUDE AND BITE BITS
92	000CC	204	4	060	BSS	2	46	DRIFT AND HEADING VELOCITY
93	000CE	206	4		BSS	2	47	SPARE
94	00000	208	4		BSS	2	48	SPARE
95	00002	210	4	05A	BSS	2	49	DELTA LATITUDE (FIX)
96	00004	212	4	062	BSS	2	50	DELTA LONGITUDE (FIX)
97	00006	214	4	057	BSS	2	51	VERTICAL DIFFERENCE VELOCITY
98	000D8	216	4	058	BSS	2	52	CROSS TRACK DIFFERENCE VELOCITY

VERSION K20A0503 DECK NAME=*NAV *

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM				SOURCE
99	0000A	218	4		059	BSS	2	53 ALONG TRACK DIFFERENCE VELOCITY
100	0000C	220	4		063	BSS	2	54 A11 ALIGNMENT MATRIX
101	0000E	222	4		064	BSS	2	55 A21 ALIGNMENT MATRIX
102	00010	224	4		065	BSS	2	56 A31 ALIGNMENT MATRIX
103	00012	226	4		066	BSS	2	57 A12 ALIGNMENT MATRIX
104	00014	228	4		067	BSS	2	58 A22 ALIGNMENT MATRIX
105	00016	230	4		068	BSS	2	59 A32 ALIGNMENT MATRIX
106	00018	232	4		069	BSS	2	60 A13 ALIGNMENT MATRIX
107	0001A	234	4		06A	BSS	2	61 A23 ALIGNMENT MATRIX
108	0001C	236	4		06B	BSS	2	62 A33 ALIGNMENT MATRIX
109	0001E	238	4			BSS	2	63 SPARE
110	00020	240	4			BSS	2	64 SPARE
111	00022	242	4		AJ	BSS	36	ALIGNMENT MATRIX
					*			
112			5		NIACOM	COMMON	5	NAV.INIT.AND ALIGN COMMON DATA
					*			
					* DELTA V'S IN I,J,K SPACE IN M/SEC/CC			
					*			
113	00000	0	5		DVXI	BSS	4	
114	00004	4	5		DVYJ	BSS	4	
115	00008	8	5		DVZK	BSS	4	
116	0000C	12	5		A	BSS	36	TEMP 3X3 MATRIX A
117	0000C	12	5		DCAM	EQU	A	
118	00030	48	5		FLGN	BSS	2	SAVE AJ(I,J) FLAG
119	00032	50	5		SAVT	BSS	4	TIME OF LAST AJ ROTATION
120	00036	54	5		ASCH	BSS	2	ALIGNMENT SCHEDULER
121	00036	54	5		NSCH	EQU	ASCH	NAVIGATION SCHEDULER
122	00036	56	5		CDU4D	BSS	12	CDU(I)*DELT I=4,6
					*			
123			6		NICOM	COMMON	6	NAV AND INIT COMMON DATA
					*			
124	00000	0	6		RAD	BSS	4	RADIUS IN METERS
125	00004	4	6		RXYZ	BSS	4	SQRT(X**2+Y**2+Z**2)
126	00008	8	6		LAT	BSS	4	EARTH RELATIVE LATITUDE
127	0000C	12	6		LONG	BSS	4	EARTH RELATIVE LONGITUDE
128	00010	16	6		DCON	BSS	2	CLOCK CYCLE COUNTER
129	00012	18	6		CHAJ	BSS	2	
					*			
					* VELOCITY IN INERTIAL SPACE IN M/SEC			
					*			
130	00014	20	6		VX	BSS	4	
131	00018	24	6		VY	BSS	4	
132	0001C	28	6		VZ	BSS	4	
133	00020	32	6		LONB	BSS	4	LONGITUDE DISPLAY BIAS
134	00024	36	6		LATB	BSS	4	LATITUDE DISPLAY BIAS
135	00028	40	6		LGO	BSS	4	LONGITUDE AT ENTRY TO NAV
136	0002C	44	6		S2GC	BSS	4	(SIN(GEOCENTRIC LATITUDE))**2
137	00030	48	6		C2GC	BSS	4	(COS(GEOCENTRIC LATITUDE))**2
138	00034	52	6		SGCL	BSS	4	SIN(GEOCENTRIC LATITUDE)
139	00038	56	6		CGCL	BSS	4	COS(GEOCENTRIC LATITUDE)
140	0003C	60	6		AB	BSS	36	(SCALE FACTOR)*(ALPHA-BETA) MATRIX AB
141	00060	96	6		GM	BSS	36	
142	00084	132	6		V1	BSS	36	POSITION UPDATE MATRIX
143	000A8	168	6		TEN	BSS	12	
144	00084	180	6		TEMO	BSS	4	

```
VERSION K20A0503     DECK NAME=*NAV   *                                                                        PAGE    4
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            145 00088   184  6         TEM1      BSS    4
            146 000BC   188  6         TEM2      BSS    4
                                       *  POSITION IN INERTIAL SPACE, METERS
                                       *
            147 000C0   192  6         X         BSS    4
            148 000C4   196  6         Y         BSS    4
            149 000C8   200  6         Z         BSS    4
                                       *
                                       *   SUMMATION OF DELTA V'S IN I,J,K SPACE IN M/SEC/CC
                                       *
            150 000CC   204  6         SDVI      BSS    4
            151 000D0   208  6         SDVJ      BSS    4
            152 000D4   212  6         SDVK      BSS    4
            153 000D8   216  6         TLPO      BSS    4            TIME OF LAST PRINTOUT
                                       *
                                       *
            154                7       MATCUM    COMMON 7            MATRIX,VECTOR,AND MISCELLANEOUS DATA
                                       *
            155 00000     0  7         SWT       BSS    4            SIN(OMEGA T)
            156 00004     4  7         CWT       BSS    4            COS(OMEGA T)
            157 00008     8  7         SGDL      BSS    4            SIN(GEODETIC LATITUDE)
            158 0000C    12  7         CGDL      BSS    4            COS(GEODETIC LATITUDE)
            159 00010    16  7         ALT       BSS    4            ALTITUDE
                                       *
                                       *    GIMBAL RESOLVER POSITION (BIAS EXCLUDED)
                                       *
            160 00014    20  7         RES1      BSS    4
            161 00018    24  7         RES2      BSS    4
            162 0001C    28  7         RES3      BSS    4
            163 00020    32  7         RES4      BSS    4
            164 00024    36  7         SRA       BSS    8            SUM OF 1-(G KNOWN)/(G ACCELERATION)
            165 0002C    44  7         NMO       BSS    2
                                       *
                                       *    COSINES OF CORRECTED GIMBAL ANGLES
                                       *
            166 0002E    46  7         C1        BSS    4
            167 00032    50  7         C2        BSS    4
            168 00036    54  7         C3        BSS    4
            169 0003A    58  7         C4        BSS    4
                                       *
                                       *    SINES OF CORRECTED GIMBAL ANGLES
                                       *
            170 0003E    62  7         S1        BSS    4
            171 00042    66  7         S2        BSS    4
            172 00046    70  7         S3        BSS    4
            173 0004A    74  7         S4        BSS    4
                                       *
            174 0004E    78  7         KSN1      BSS    2            GAIN COLUMN INDEX
            175 00050    80  7         KSN2      BSS    2            GAIN COLUMN INDEX
            176 00052    82  7         KSN3      BSS    2            GAIN COLUMN INDEX
            177 00054    84  7         D1        BSS    36           TEMP 3X3 MATRIX
            178 00078   120  7         DG        BSS    36           TOTAL GIMBAL AND THEN TSP2
                                       *
                                       *    STATE MATRIX ( STORED ROW MAJOR ORDER )
                                       *****      E11 = PSI = HEADING
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
                                  *****     E12 = THETA = PITCH
                                  *****     E13 = PHI = ROLL
                                  *
                                  *
          179 0009C    156  7     E1        BSS    12
          180 000A8    168  7     E2        BSS    12
          181 000B4    180  7     E3        BSS    12
          182 000C0    192  7     DC        BSS    36          VEHICLE TO CASE TRANSFORMATION MATRIX
          183 000E4    228  7     D         BSS    36          TEMP 3X3 MATRIX
          184 00108    264  7     SA        BSS    36          SAVE AJ MATRIX
          185 0012C    300  7     TM        BSS    36          TEMP 3X3 MATRIX
          186 00150    336  7     TM1       BSS    36          TEMP 3X3 MATRIX
          187 00174    372  7     VECT      BSS    34          TABLE OF SUBROUTINE CALLS
          188 00150    336  7     AP        EQU    TM1         TEMP 3X1 VECTOR
          189 0015C    348  7     AT        EQU    TM1+12      TEMP 3X1 VECTOR
          190 000E4    228  7     J3X3      EQU    D
          191 00150    336  7     K3X3      EQU    TM1
          192 00054     84  7     L3X3      EQU    D1
          193 00024     36  7     LCA1      EQU    SRA         LAST GIMBAL 1 COMMAND
          194 00028     40  7     LCA4      EQU    SRA+4       LAST GIMBAL 4 COMMAND
          195 00008      8  7     SL        EQU    SGDL        SIN(LAT) GEODETIC
          196 0000C     12  7     CL        EQU    CGDL        COS(LAT) GEODETIC
                                  *
                                  *
                                  *    GEANS WORLD COMMON CONSTANTS DATA AREA
                                  *
          197                  9  CONCOM    COMMON 9
                                  *
          198 00000      0  9 FFFFFFC0 N64       DEC    -64
          199 00002      2  9 FFFFFFF8 NOCSK     DEC    -8
          200 00004      4  9 FFFFFFFC NFOUR     DEC    -4
          201 00006      6  9 FFFFFFFE NTWO      DEC    -2
          202 00008      8  9 FFFFFFFF NONE    DEC    -1
          203 0000A     10  9 00000001 ONE       DEC    1
          204 0000C     12  9 00000002 TWO       DEC    2
          205 0000E     14  9 00000003 THREE     DEC    3
          206 00010     16  9 00000004 FOUR      DEC    4
          207 00012     18  9 00000006 SIX       DEC    6
          208 00014     20  9 00000007 SEVEN     DEC    7
          209 00016     22  9 00000008 EIGHT     DEC    8
          210 00018     24  9 00000009 NINE      DEC    9
          211 0001A     26  9 0000000A TEN       DEC    10
          212 0001C     28  9 00000000 ZERO      DEC    0
          213 0001E     30  9 40C00000 FONE      DEC    1.0
          214 0001C     28  9          DFONE     EQU    ZERO
          215 0001C     28  9          DTOC      EQU    ZERO        DELTA TIME FOR DC = 1.0 SECOND
          216 00020     32  9 00000000 ONHLF     DEC64  0.5
                                   40400000
          217 00024     36  9 D21C399D OMGA      DEC64  7.2921158E-5  EARTH ROTATION RATE  RAD/SEC
                                   39CC769F
          218 00028     40  9 58E200CB OMEG      DEC64  2.32115255E-5  EARTH RATE   PI RAD/SEC
                                   39E1582F
          219 0002C     44  9 2EDC506C KGDL      DEC64  1.00673966    GEODETIC LATITUDE CONSTANT
                                   40C06E6C
          220 00030     48  9 00000000 DELT      DEC64  0.125         DELTA TIME = 1/8 SECOND
                                   3FC00000
          221 00034     52  9 00000000 D1032     DEC64  0.03125       DOUBLE PRECISION 1/32
```

```
                       3E400000
222 00038       56   9 00000000 D3032      DEC64   .09375          =3/32
                       3EE00000
                                *
                                *   CALIBRATION DATA.     CD01-CD64
                                *
223 0003C       60   9 41585226 CD01       DEC64   .011952910      X ACCEL SCALE FACTOR  M/SEC/PULSE
                       3D61E811
224 00040       64   9 41585226 CD02       DEC64   .011952910      Y ACCEL SCALE FACTOR  M/SEC/PULSE
                       3D61E811
225 00044       68   9 41585226 CD03       DEC64   .011952910      Z ACCEL SCALE FACTOR  M/SEC/PULSE
                       3D61E811
226 00048       72   9 00000000 CD04       DEC64   0               X ACCEL BIAS   PULSE/SEC
                       00000000
227 0004C       76   9 00000000 CD05       DEC64   0               Y ACCEL BIAS   PULSE/SEC
                       00000000
228 00050       80   9 00000000 CD06       DEC64   0               Z ACCEL BIAS   PULSE/SEC
                       00000000
229 00054       84   9 00000000 CD07       DEC64   1.0             B11 ACCEL MISALIGNMENT
                       40C00000
230 00058       88   9 00000000 CD08       DEC64   0               B12 ACCEL MISALIGNMENT
                       00000000
231 0005C       92   9 00000000 CD09       DEC64   0               B13 ACCEL MISALIGNMENT
                       00000000
232 00060       96   9 00000000 CD10       DEC64   0               B21 ACCEL MISALIGNMENT
                       00000000
233 00064      100   9 00000000 CD11       DEC64   1.0             B22 ACCEL MISALIGNMENT
                       40C00000
234 00068      104   9 00000000 CD12       DEC64   0               B23 ACCEL MISALIGNMENT
                       00000000
235 0006C      108   9 00000000 CD13       DEC64   0               B31 ACCEL MISALIGNMENT
                       00000000
236 00070      112   9 00000000 CD14       DEC64   0               B32 ACCEL MISALIGNMENT
                       00000000
237 00074      116   9 00000000 CD15       DEC64   1.0             B33 ACCEL MISALIGNMENT
                       40C00000
238 00078      120   9 00000000 CD16       DEC64   0               GYRO TORQUE,G INDEPEN,DYNE-CM
                       00000000
239 0007C      124   9 00000000 CD17       DEC64   0               GYRO TORQUE,G INDEPEN,DYNE-CM
                       00000000
240 00080      128   9 00000000 CD18       DEC64   0               GYRO TORQUE,G INDEPEN,DYNE-CM
                       00000000
241 00084      132   9 00000000 CD19       DEC64   0               G11 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                       00000000
242 00088      136   9 00000000 CD20       DEC64   0               G12 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                       00000000
243 0008C      140   9 00000000 CD21       DEC64   0               G13 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                       00000000
244 00090      144   9 00000000 CD22       DEC64   0               G21 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                       00000000
245 00094      148   9 00000000 CD23       DEC64   0               G22 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                       00000000
246 00098      152   9 00000000 CD24       DEC64   0               G23 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                       00000000
247 0009C      156   9 00000000 CD25       DEC64   0               G31 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                       00000000
248 000A0      160   9 00000000 CD26       DEC64   0               G32 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                       00000000
249 000A4      164   9 00000000 CD27       DEC64   0               G33 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                       00000000
```

250	00A8	168	4	00000000 00000000	CD28	DEC64 0	RAT GYRO TORQUE DYNE-CM
251	00AC	172	4	00000000 00000000	CD29	DEC64 0	RAT GYRO TORQUE DYNE-CM
252	00B0	176	4	00000000 00000000	CD30	DEC64 0	SPEED COMP,G INDEPENDENT DYNE-CM
253	00B4	180	4	00000000 00000000	CD31	DEC64 0	SPEED COMP,G INDEPENDENT DYNE-CM
254	00B8	184	4	00000000 00000000	CD32	DEC64 0	SPEED COMP,G INDEPENDENT DYNE-CM
255	00BC	188	4	00000000 00000000	CD33	DEC64 0	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
256	00C0	192	4	00000000 00000000	CD34	DEC64 0	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
257	00C4	196	4	00000000 00000000	CD35	DEC64 0	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
258	00C8	200	4	00000000 00000000	CD36	DEC64 0	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
259	00CC	204	4	00000000 00000000	CD37	DEC64 0	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
260	00D0	208	4	00000000 00000000	CD38	DEC64 0	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
261	00D4	212	4	00000000 00000000	CD39	DEC64 0	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
262	00D8	216	4	00000000 00000000	CD40	DEC64 0	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
263	00DC	220	4	00000000 00000000	CD41	DEC64 0	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
264	00E0	224	4	00000000 00000000	CD42	DEC64 0	AIRP RAT SPEED COMP DYNE-CM
265	00E4	228	4	00000000 00000000	CD43	DEC64 0	AIRP RAT SPEED COMP DYNE-CM
266	00E8	232	4	00000000 3FC00000	CD44	DEC64 0.25	STARTING LOCUS PI RADIANS
267	00EC	236	4	00000000 00000000	CD45	DEC64 0	BETA(1Z) MISALIGNMENT PI RADIANS
268	00F0	240	4	00000000 00000000	CD46	DEC64 0	GIMBAL 1 RESOLVER BIAS PI RADIANS
269	00F4	244	4	00000000 00000000	CD47	DEC64 0	GIMBAL 2 RESOLVER BIAS PI RADIANS
270	00F8	248	4	00000000 00000000	CD48	DEC64 0	GIMBAL 3 RESOLVER BIAS PI RADIANS
271	00FC	252	4	00000000 00000000	CD49	DEC64 0	GIMBAL 4 RESOLVER BIAS PI RADIANS
272	0100	256	4	00000000 00000000	CD50	DEC64 0	PLATFORM AZIMUTH ALIGN IN PI RADIANS
273	0104	260	4	00000000 00000000	CD51	DEC64 0	PLATFORM ELEVATION ALIGN IN PI RADIANS

```
VERSION K2040503      DECK NAME=*NAV    *                                                                     PAGE    6

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
            274 00108    264   9 B55FF2F4 CD52        DEC64   .59594852     VERTICAL DAMPING CONSTANT,
                                 404C480A
                                          *                                 0.59594852 IN M/SEC/M*2**31
            275 0010C    268   9 00000000 CD53        DEC64   0             VERTICAL VELOCITY GAIN     UNITLESS
                                 00000000
            276 00110    272   9 00000000 CD54        DEC64   0             LOADED HEADING            PI RADIANS
                                 00000000
            277 00114    276   9 00000000 CD55        DEC64   0             LOADED LATITUDE      PI RADIANS
                                 00000000
            278 00118    280   9 00000000 CD56        DEC64   0             LOADED LONGITUDE          PI RADIANS
                                 00000000
            279 0011C    284   9 69835158 CD57        DEC64   9.7803200     LOCAL GRAVITY             METERS/SEC**2
                                 424E3E18
            280 00120    288   9 0887E3F2 CD58        DEC64   83.661634     1/SCALE FACTOR            PULSES/M/SEC
                                 43034960
            281 00124    292   9 00000000 CD59        DEC64   656.0         ROTOR 1 SPEED       REVOLUTIONS/SEC
                                 45520000
            282 00128    296   9 00000000 CD60        DEC64   656.0         ROTOR 2 SPEED       REVOLUTIONS/SEC
                                 45520000
            283 0012C    300   9 00000000 CD61        DEC64   23.8125       BARO ALT SCALE FACTOR     METERS/BIT
                                 426F4000
            284 00130    304   9 00000000 CD62        DEC64   0             BARO ALTITUDE BIAS        BITS
                                 00000000
            285 00134    308   9 00018000 CD63        HEX     00018000      ALTIMETER / AHRS FLAGS    NONE
            286 00136    310   9 00000000             HEX     0
            287 00138    312   9 00000000 CD64        DEC64   0             ALTITUDE                  METERS
                                 00000000
                                          *
                                          *
            288                 13                    USE     13
                                          *
            289                 13                    ORG     BUFORG
            290 05100  20736 13           DECFLG      BSS     2             PDP-11 FLAG
            291 05102  20738 13           BTIME       BSS     4             TIME
            292 05106  20742 13           BLAT        BSS     4             LATITUDE
            293 0510A  20746 13           BLONG       BSS     4             LONGITUDE
            294 0510E  20750 13           BVV         BSS     12            VV,VE,AND VN
            295 0511A  20762 13           BVX         BSS     12            VX,VY,AND VZ
                                          *
                                          *
            296                  1                    USE     1
            297                                       EVEN
            298                                       ENTRY   IC,ID,IE,IF,IF2,IG,IH,IJ,IK,IL,IM
                                          *
            299 00000      0   1          GXDT        BSS     4             GRAVITY MODEL VARIABLES
            300 00004      4   1          GYDT        BSS     4
            301 00008      8   1          GZDT        BSS     4
            302 0000C     12   1          P           BSS     4
            303 00010     16   1          P3          BSS     4
            304 00014     20   1          P5          BSS     4
            305 00018     24   1          TEM3        BSS     4
            306 0001C     28   1          TEM4        BSS     4
            307 00020     32   1          TEM5        BSS     4
            308 00024     36   1          CCLG        BSS     4             COS(CELESTIAL LONGITUDE)
            309 00028     40   1          SCLG        BSS     4             SIN(GEOCENTRIC LATITUDE)
```

```
DIAGNOSTICS LINE ADRES OADRES LC  PROGRAM                                SOURCE
                                  *
                                  *
                                  *
                                  *DAMPING VECTOR, M/SEC
                                  *
          310 0002C     44  1     LDVX      BSS     4
          311 00030     48  1     LDVY      BSS     4
          312 00034     52  1     LDVZ      BSS     4
          313 00038     56  1     DVI       BSS     12          ACCELEROMETER TO GYRO ROTATION VECTOR
          314 00044     68  1     F1        BSS     4           1-(SRT1/DC04)**2
          315 00048     72  1     F2        BSS     4           1-(SRT2/DC04)**2
          316 0004C     76  1     VV        BSS     4           VERTICAL VELOCITY IN LOCAL VERTICAL
          317 00050     80  1     VE        BSS     4           EAST VELOCITY IN LOCAL VERTICAL
          318 00054     84  1     VN        BSS     4           NORTH VELOCITY IN LOCAL VERTICAL
          319 00058     88  1     IND       BSS     2
                                  *
                                  *     EARTH RELATIVE VELOCITY
                                  *
          320 00054     90  1     VXE       BSS     4
          321 0005E     94  1     VYE       BSS     4
          322 00062     98  1     VZE       BSS     4
                                  *
          323 00066    102  1     GS        BSS     4           GROUND SPEED
          324 0006A    106  1     VEL2      BSS     4           VV**2+VE**2+VN**2
                                  *
                                  *     RETURN ADDRESS LOCATIONS
                                  *
          325 0006E    110  1     IAM       BSS     2
          326 00070    112  1     ICM       BSS     2
          327 00070    112  1     IDM       EQU     ICM
          328 00070    112  1     IEM       EQU     ICM
          329 00070    112  1     IFM       EQU     ICM
          330 00072    114  1     IF2M      BSS     2
          331 00070    112  1     IGM       EQU     ICM
          332 00070    112  1     IHM       EQU     ICM
          333 00070    112  1     IJM       EQU     ICM
          334 00074    116  1     DUMMET    BSS     2
          335 00070    112  1     ILM       EQU     ICM
          336 00070    112  1     IAM       EQU     ICM
          337 00076    116  1     INM       BSS     2
          338 00078    120  1     NAVOR     BSS     2           NAVO RETURN ADDRESS LOCATION
                                  *
          339 0007A    122  1     DELR      BSS     4           DELTA RADIUS IN METERS
                                  *
          340               2               USE     2
                                  *
                                  *     45 DEGREE ROTATION MATRIX
                                  *
          341 00000      0  2 00000000 R45M      DEC64   0
                              00000000
          342 00004      4  2 999960F7           DEC64   0.707106781   SQRT(2)/2
                              405A8279
          343 00008      8  2 00009F09           DEC64   -0.707106781  -SQTR(2)/2
                              C0257086
          344 0000C     12  2 00000000           DEC64   0
                              00000000
          345 00010     16  2 999960F7           DEC64   0.707106781   SQRT(2)/2
```

```
                       405A8279
346 00014    20  2 999660F7              DEC64   0.707106781     SQRT(2)/2
                       405A8279
347 00018    24  2 00000000              DEC64   1.0
                       40C00000
348 0001C    28  2 00000000              DEC64   0
                       00000000
349 00020    32  2 00000000              DEC64   0
                       00000000
                                *
                                *
                                *       GRAVITY CONSTANTS    DOUBLE PRECISION
                                *
350 00024    36  2 99900505 GCA0     HEX     99900505        A0=-1.536227137E-6
351 00026    38  2 E698E7D1          HEX     E698E7D1
352 00028    40  2 9BF18280 GCA1     HEX     9BF18280        A1=1.247433376E-8
353 0002A    42  2 33682759          HEX     33682759
354 0002C    44  2 04722F1E GCA2     HEX     04722F1E        A2=-1.593661308E-11
355 0002E    46  2 AE89E8F8          HEX     AE89E8F8
356 00030    48  2 66666666 GCA3     HEX     66666666        A3=0.2
357 00032    50  2 3F666666          HEX     3F666666
358 00034    52  2 66666666 GCA4     HEX     66666666        A4=0.4
359 00036    54  2 3FE66666          HEX     3FE66666
360 00038    56  2 6D064592 GCA5     HEX     6D064592        A5=0.4285714286
361 0003A    58  2 3FED8608          HEX     3FED8608
362 0003C    60  2 6D685212 GCA6     HEX     6D685212        A6=1.714285714
363 0003E    62  2 40ED8608          HEX     40ED8608
364 00040    64  2 00000000 RADE     DEC64   6378145.0       EQUATORIAL RADIUS IN METERS
                       48E152A1
                                *
                                *    FLOATING AND FIXED POINT CONSTANTS
                                *
365 00044    68  2 41E00000 FSIX     DEC     6.0
366 00046    70  2 42480000 FNINE    DEC     9.0
367 00048    72  2 42500000 FTEN     DEC     10.0
                                *
                                *    SYSTEM CONSTANTS
                                *
368 0004A    74  2 5FED4660 KR1      DEC64   0.00503
                       3CD26959
369 0004E    78  2 00000000 KR3      DEC64   21385.0
                       47D38900
370 00052    82  2 00000000 DC04     DEC64   656.0           REFERENCE ROTOR SPEED
                       45520000
371 00056    86  2 1C00465A DC42     HEX     1C00465A        =0.00462630681
372 00058    88  2 3CC8CC23          HEX     3CC8CC23
373 0005A    90  2 00835DEF DC43     HEX     00835DEF        =0.00654258584
374 0005C    92  2 3CE83198          HEX     3CE83198
```

```
VERSION K20A0503      DECK NAME=*NAV   *                                                        PAGE   8
                                                                          SOURCE
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM
              376                                    ENTRY   IA
              377                                    EVEN
                                             *
                                             *          NAVIGATION SUB-EXECUTIVE
                                             *
                                             *     THIS ROUTINE IS ENTERED EVERY 1/32 SECOND AND PROVIDES FOUR
                                             *     BRANCHES FOR A 1/8 SECOND COMPUTATION CYCLE.
                                             *
                                             *
R             378 0005E    94  2 0000006E IA      PTR     IAM
              379 00060    96  2 64040000         JS      IB
              380 00062    98  2 14000036 IA1     LDA     NSCH              NSCH=NSCH+1
              381 00064   100  2 A400000A         ADD     ONE
              382 00066   102  2 3C000036         STA     NSCH
              383 00068   104  2 0841             SLL     1
              384 00069   105  2      06C0        LXA     8
              385 0006A   106  2 7440006C         RTA     IA1A+8
              386 0006C   108  2 00000074 IA1A    PTR     IA2
              387 0006E   110  2 00000082         PTR     IA3
              388 00070   112  2 00000088         PTR     IA4
              389 00072   114  2 0000008C         PTR     IA5
              390 00074   116  2 0700     IA2     NOP
              391 00075   117  2      0700        NOP
                                             ********************
                                             *
                                             *    PROFILE NEEDED? IF SO CALL DUMY
                                             *
                                             ********************
              392 00076   118  2 64040098         JS      IC
              393 00078   120  2 6404008E         JS      ID
              394 0007A   122  2 640400CC         JS      IE
              395 0007C   124  2 640401C8         JS      IF
              396 0007E   126  2 6404022A         JS      IG
              397 00080   128  2 7400006E         RTA     IAM
              398 00082   130  2 6404024E IA3     JS      IH
              399 00084   132  2 6404031E         JS      IJ
              400 00086   134  2 7400006E         RTA     IAM
              401 00088   136  2 640406A4 IA4     JS      NAVO              CALL NAV OUTPUT ROUTINE
              402 0008A   138  2 7400006E         RTA     IAM
              403 0008C   140  2 6404040C IA5     JS      IL
              404 0008E   142  2 64040632         JS      IM
              405 00090   144  2 6404066E         JS      RTAL
              406 00092   146  2 14000008         LDA     NONE              NSCH=-1
              407 00094   148  2 3C000036         STA     NSCH
              408 00096   150  2 7400006E         RTA     IAM
```

```
VERSION K20A0503      DECK NAME=*NAV   *                                                       PAGE   9

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                          *
                                          *
              410                                  EVEN
                                          *
                                          *      ACCELEROMETER BIAS AND SCALE FACTOR COMPUTATION.
                                          *      ACCELEROMETER NON-ORTHOGONALITY COMPENSATION.
                                          *
                                          *
              411 0009B      152  2 00000070 IC          PTR      ICM
              412 0009A      154  2 64040000 IC1         JS       VECSUB
              413 0009C      156  2 6008                 JRU      *+8
GENERATED                             0700
              414 0009E      158  2 00000014             PTR      DVXG
              415 000A0      160  2 00000038             PTR      CD040
              416 000A2      162  2 00000014             PTR      DVXG
              417 000A4      164  2 64040000             JS       MULD31
              418 000A6      166  2 6008                 JRU      *+8
GENERATED                             0700
              419 000A8      168  2 0000003C             PTR      AB
              420 000AA      170  2 00000014             PTR      DVXG
              421 000AC      172  2 00000000             PTR      DVXI
              422 000AE      174  2 1400001C IC2         LDA      ZERO
              423 000B0      176  2 3C000014             STA      DVXG
              424 000B2      178  2 3C000016             STA      DVXG+2
              425 000B4      180  2 3C000018             STA      DVXG+4
              426 000B6      182  2 3C00001A             STA      DVXG+6
              427 000B8      184  2 3C00001C             STA      DVXG+8
              428 000BA      186  2 3C00001E             STA      DVXG+10
              429 000BC      188  2 74000070             RTA      ICM
```

VERSION K20A0503 DECK NAME=*NAV *


```
DIAGNOSTICS LINE ADRES OADRES LC  PROGRAM                                SOURCE
                                                  *
                                                  *     ROTATION FROM PLATFORM FRAME TO NAVIGATION FRAME
                                                  *
            431 0008E    190  2 00000070 ID        PTR     IDM
            432 000C0    192  2 64040000 ID1       JS      MULD31
            433 000C2    194  2 6008               JRU     **8
GENERATED                          0700
            434 000C4    196  2 000000F2          PTR     AJ
            435 000C6    198  2 00000000          PTR     DVXI
            436 000C8    200  2 0000003E          PTR     DVX
            437 000CA    202  2 74000070          RTA     IDM
```

DIAGNOSTICS LINE ADRES DADRES LC PROGRAM SOURCE

```
                                        *   COMPUTATION OF GRAVITY MODEL
                                        *
                                        *
439                                         EVEN
440 000CC    204  2 00000070 IE         PTR   IEM
441 000CE    206  2 5C220040 IE1        LDX   4,RADE,M       LOAD XR4 WITH ADDRESS OF DIVISOR
442 000D0    208  2 1400007C            LDA   DELR+2
443 000D2    210  2 5400007A            LDB   DELR            LOAD (A,B) WITH DIVIDEND
444 000D4    212  2 64040000            JS    DVFD            (DELR/RADE)
445 000D6    214  2 3C0000AA            STA   TEM+2           SAVE (DELR/RADE)
446 000D8    216  2 7C0000A8            STB   TEM
447 000DA    218  2 5C2200A8            LDX    4,TEM,M
448 000DC    220  2 64040000            JS    MULFD           (DELR/RADE)**2
449 000DE    222  2 9C0000A8            AFD   TEM             (DELR/RADE)+(DELR/RADE)**2
450 000E0    224  2 3C0000AA            STA   TEM+2
451 000E2    226  2 7C0000A8            STB   TEM
452 000E4    228  2 1400001E            LDA    FONE
453 000E6    230  2 5400001C            LDB   ZERO
454 000E8    232  2 DC0000A8            SFD   TEM             1.0-(DELR/RADE)+(DELR/RADE)**2
455 000EA    234  2 3C00000E            STA   P+2             STORE RESULT IN P
456 000EC    236  2 7C00000C            STB   P
457 000EE    238  2 5C22000C IE2        LDX   4,P,M
458 000F0    240  2 64040000            JS    MULFD           P**2
459 000F2    242  2 3C000016            STA   P5+2
460 000F4    244  2 7C000014            STB   P5
461 000F6    246  2 64040000            JS    MULFD           P**3
462 000F8    248  2 3C000012            STA   P3+2
463 000FA    250  2 7C000010            STB   P3
464 000FC    252  2 5C220014            LDX    4,P5,M
465 000FE    254  2 64040000            JS    MULFD           P**5
466 00100    256  2 3C000016            STA   P5+2
467 00102    258  2 7C000014            STB   P5
468 00104    260  2 5C22002C            LDX    4,S2GC,M
469 00106    262  2 14000044            LDA   FSIX
470 00108    264  2 5400001C            LDB   ZERO
471 0010A    266  2 64040000            JS    MULFD           6.0*S2GC
472 0010C    268  2 3C0000AA            STA   TEM+2
473 0010E    270  2 7C0000A8            STB   TEM
474 00110    272  2 14000048            LDA   FTEN
475 00112    274  2 5400001C            LDB   ZERO
476 00114    276  2 64040000            JS    MULFD           10.0*S2GC
477 00116    278  2 3C0000B6            STA   TEM0+2
478 00118    280  2 7C0000B4            STB   TEM0
479 0011A    282  2 1400002E            LDA   S2GC+2
480 0011C    284  2 5400002C            LDB   S2GC
481 0011E    286  2 64040000            JS    MULFD           S2GC**2
482 00120    288  2 3C0000BA            STA   TEM1+2
483 00122    290  2 7C0000B8            STB   TEM1            SAVE S2GC**2
484 00124    292  2 5C2200B8            LDX   4,TEM1,M
485 00126    294  2 14000046            LDA   FNINE
486 00128    296  2 5400001C            LDB   ZERO
487 0012A    298  2 64040000            JS    MULFD           9.0*S2GC**2
488 0012C    300  2 3C0000BA            STA   TEM1+2          SAVE (9.0*S2GC**2)
489 0012E    302  2 140000AA            LDA   TEM+2
```

VERSION K20A0503 DECK NAME=*NAV *


```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM          SOURCE
          490 00130    304  2 540000A8      LDB   TEM
          491 00132    306  2 9C0000B6      AFD   TEM1          6.0*S2GC+9.0*S2GC**2
          492 00134    308  2 3C0000BE      STA   TEM2+2        SAVE IT
          493 00136    310  2 7C0000BC      STB   TEM2
          494 00138    312  2 1400003A      LDA   GCA5+2
          495 0013A    314  2 54000036      LDB   GCA5
          496 0013C    316  2 DC0000BC      SFD   TEM2          (GCA5-6.0*S2GC+9.0*S2GC**2)
          497 0013E    318  2 5C22002C      LDX   4,GCA2,M
          498 00140    320  2 64040000      JS    MULFD         GCA2*(GCA5-6.0*S2GC+9.0*S2GC**2)
          499 00142    322  2 3C0000BE      STA   TEM2+2
          500 00144    324  2 7C0000BC      STB   TEM2
          501 00146    326  2 14000032      LDA   GCA3+2
          502 00148    328  2 54000030      LDB   GCA3
          503 0014A    330  2 DC00002C      SFD   S2GC          (GCA3-S2GC)
          504 0014C    332  2 3C00001E      STA   TEM4+2        SAVE IT
          505 0014E    334  2 7C00001C      STB   TEM4
          506 00150    336  2 5C22001C      LDX   4,TEM4,M
          507 00152    338  2 1400002A      LDA   GCA1+2
          508 00154    340  2 54000028      LDB   GCA1
          509 00156    342  2 64040000      JS    MULFD         GCA1*(GCA3-S2GC)
          510 00158    344  2 5C220014      LDX   4,P5,M
          511 0015A    346  2 64040000      JS    MULFD         GCA1*(GCA3-S2GC)*P**5
          512 0015C    348  2 3C000022      STA   TEM5+2
          513 0015E    350  2 7C000020      STB   TEM5          SAVE IT
          514 00160    352  2 5C22C010      LDX   4,P3,M
          515 00162    354  2 14000026      LDA   GCA0+2
          516 00164    356  2 54000024      LDB   GCA0
          517 00166    358  2 64040000      JS    MULFD         GCA0*P**3
          518 00168    360  2 3C00001A      STA   TEM3+2        SAVE IT
          519 0016A    362  2 7C000018      STB   TEM3
          520 0016C    364  2 DC000020      SFD   TEM5          GCA0*P**3-GCA1(GCA3-S2GC)*P**5
                                *
          521 0016E    366  2 9C0000BC      AFD   TEM2          GCA2*(GCA5-6*S2GC+9*S2GC**2)
                                *                             +GCA0*P**3-GCA1(GCA3-S2GC)*P**5
                                *
          522 00170    368  2 3C0000BE      STA   TEM2+2        STORE RESULT
          523 00172    370  2 7C0000BC      STB   TEM2
          524 00174    372  2 5C2200BC      LDX   4,TEM2,M
          525 00176    374  2 140000C2      LDA   X+2           LOAD A,B WITH X
          526 00178    376  2 540000C0      LDB   X
          527 0017A    378  2 64040000      JS    MULFD         MULTIPLY BY GRAVITY MODEL
          528 0017C    380  2 3C000002      STA   GXDT+2        STORE IN GXDT
          529 0017E    382  2 7C000000      STB   GXDT
          530 00180    384  2 140000C6      LDA   Y+2
          531 00182    386  2 540000C4      LDB   Y             LOAD A,B WITH Y
          532 00184    388  2 64040000      JS    MULFD         MULTIPLY BY GRAVITY MODEL
          533 00186    390  2 3C000006      STA   GYDT+2        STORE IN GYDT
          534 00188    392  2 7C000004      STB   GYDT
          535 0018A    394  2 140000B6      LDA   TEM0+2
          536 0018C    396  2 540000B4      LDB   TEM0
          537 0018E    398  2 9C0000B8      AFD   TEM1          10*S2GC+9*S2GC**2
          538 00190    400  2 3C0000BA      STA   TEM1+2        SAVE IT
          539 00192    402  2 7C0000B8      STB   TEM1
          540 00194    404  2 1400003E      LDA   GCA6+2
          541 00196    406  2 5400003C      LDB   GCA6
```

```
VERSION K20A0503      DECK NAME=*NAV    *                                                              PAGE  13

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
            542 00198    408  2 9C000038          AFD     GCA5          (GCA6+GCA5)
            543 0019A    410  2 DC000088          SFD     TEM1          GCA6+GCA5-10*S2GC+9*S2GC**2
            544 0019C    412  2 5C22002C          LDX     4,GCA2,M
            545 0019E    414  2 64040000          JS      MULFD         GCA2*(GCA6+GCA5-10*S2GC+9*S2GC**2)
            546 001A0    416  2 3C00008A          STA     TEM1+2        SAVE IT
            547 001A2    418  2 7C000088          STB     TEM1
            548 001A4    420  2 14000036          LDA     GCA4+2
            549 001A6    422  2 54000034          LDB     GCA4
            550 001A8    424  2 9C00001C          AFD     TEM4          (GCA4+GCA3-S2GC)
            551 001AA    426  2 5C220028          LDX     4,GCA1,M
            552 001AC    428  2 64040000          JS      MULFD         GCA1*(GCA4+GCA3-S2GC)
            553 001AE    430  2 5C220014          LDX     4,P5,M
            554 001B0    432  2 64040000          JS      MULFD         GCA1*(GCA4+GCA3-S2GC)*P**5
            555 001B2    434  2 3C00001E          STA     TEM4+2
            556 001B4    436  2 7C00001C          STB     TEM4
            557 001B6    438  2 1400001A          LDA     TEM3+2        LOAD (GCA0*P**3)
            558 001B8    440  2 54000018          LDB     TEM3
            559 001B4    442  2 DC00001C          SFD     TEM4          GCA0*P**3-GCA1(GCA4+GCA3-S2GC)*P**5
                                           *
            560 001BC    444  2 9C000088          AFD     TEM1          GCA2*(GCA6+GCA5-10*S2GC+9*S2GC**2)
                                           *                            +GCA0*P**3-GCA1(GCA4+GCA3-S2GC)**P**5
            561 001BE    446  2 5C2200C6          LDX     4,Z,M         MULTIPLY WHOLE THING BY Z
            562 001C0    448  2 64040000          JS      MULFD
            563 001C2    450  2 3C00000A          STA     GZDT+2        STORE RESULT IN GZDT
            564 001C4    452  2 7C000008          STB     GZDT
            565 001C6    454  2 74000070          RTA     IEM
```

```
VERSION K20A0503     DECK NAME=*NAV   *                                                      PAGE  14

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
                                           *
                                           *   VERTICAL DAMPING COMPUTATION
                                           *
                                           *
                                           *
                                               EVEN
 001C8    456  2 00000070 IF            PTR   IFM
 001CA    458  2 64040200               JS    IF2
 001CC    460  2 5C28001A IF1           LDX   5,TEN
 001CE    462  2 14000002               LDA   RAD+2
 001D0    464  2 54000000               LDB   RAD
 001D2    466  2 DC000004               SFD   RXYZ          RAD-RXYZ
 001D4    468  2 3C000086               STA   TEM0+2
 001D6    470  2 7C000084               STB   TEM0
 001D8    472  2 14000012               LDA   ALT+2
 001DA    474  2 54000010               LDB   ALT
 001DC    476  2 DC000084               SFD   TEM0          ALT-(RAD-RXYZ)
 001DE    478  2 0400                   CFX                 FIX IT
 001DF    479  2     0850               SLL   16            SCALE TO 2**0
 001E0    480  2 3C01008D               STAH  046+1         046 DATA=ALT-(RAD-RXYZ)
 001E2    482  2 14000086               LDA   TEM0+2
 001E4    484  2 54000084               LDB   TEM0          (A+B)=(RAD-RXYZ)
 001E6    486  2 5C220108               LDX   4,COS2,M
 001E8    488  2 64040000               JS    MULFD         COS2*(RAD-RXYZ)
 001EA    490  2 3C0000AA               STA   TE4+2
 001EC    492  2 7C0000A8               STB   TE4
 001EE    494  2 5C2200A8               LDX   4,TEM,M       (XR4 )=ADDRESS OF ARGUEMENT
 001F0    496  2 168000C0 IF1A          LDA   X,5           LOAD A WITH X+2
 001F2    498  2 5680008E               LDB   X-2,5         LOAD B WITH X
 001F4    500  2 64040000               JS    MULFD         COS2*(RAD-RXYZ)*(X OR Y OR Z)
 001F6    502  2 7E80002A               STB   LDVX-2,5      STORE RESULT
 001F8    504  2 3E80002C               STA   LDVX,5
 001FA    506  2 6C290010               IMN   5,FOUR        DECREMENT POINTER FOR NEXT ARGUEMENT
 001FC    508  2 643001F0               JGU   IF1A          GO BACK FOR ANOTHER
 001FE    510  2 74000070               RTA   IFM
```

```
VERSION K20A0503      DECK NAME=*NAV    *                                                                          PAGE  15

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
                                          *
                                          *   COMPUTE EARTH RADIUS AND DELTA RADIUS
                                          *
            598 00200    512  2 00000072 IF2       PTR     IF2M
            599 00202    514  2 14000032           LDA     C2GC+2
            600 00204    516  2 54000030           LDB     C2GC
            601 00206    518  2 5C22004A           LDX     4,KR1,M       KR1=.00503
            602 00208    520  2 64040000           JS      MULFD         .00503*C2GC
            603 0020A    522  2 9C00001C           AFD     DFONE         1.0+.00503*C2GC
            604 0020C    524  2 5C22002C           LDX     4,S2GC,M
            605 0020E    526  2 64040000           JS      MULFD         S2GC*(1+.00503*C2GC)
            606 00210    528  2 5C22004E           LDX     4,KR3,M       KR3= 21385.0
            607 00212    530  2 64040000           JS      MULFD         21385.*S2GC*(1+.00503*C2GC)
            608 00214    532  2 3C0000AA           STA     TEM+2
            609 00216    534  2 7C0000A8           STB     TEM
            610 00218    536  2 14000012           LDA     ALT+2
            611 0021A    538  2 54000010           LDB     ALT
            612 0021C    540  2 DC0000A8           SFD     TEM           ALT-(21385*S2GC*(1+.00503*C2GC))
            613 0021E    542  2 3C00007C           STA     DELR+2
            614 00220    544  2 7C00007A           STB     DELR
            615 00222    546  2 9C000040 IF3       AFD     RADE          RAD=DELR+RADE
            616 00224    548  2 3C000002           STA     RAD+2
            617 00226    550  2 7C000000           STB     RAD
            618 00228    552  2 74000072           RTA     IF2M
```

DIAGNOSTICS LINE ADRES DADRES LC PROGRAM SOURCE

```
*
*    THIS ROUTINE DOES DOUBLE INTEGRATION FOR VELOCITY AND DISTANCE
*    AS FOLLOWS:
*
*    **  ** **  **      **    ** **   **
*    * VX * * VX *      * GXDT * * DVX *
*    * VY *+* VY *+DELT** GYDT *+* DVY *
*    * VZ * * VZ *      * GZDT * * DVZ *
*    **  ** **  **      **    ** **   **
*
*
*    ** ** ** **      **   **    ** **  **  **
*    * X * * X *      *    * LDVX * * VX *   *
*    * Y *+* Y *+DELT**    * LDVY *+* VY *   *
*    * Z * * Z *      *    * LDVZ * * VZ *   *
*    ** ** ** **      **   **    ** **  **  **
*
*
```

```
620 0022A   554  2 00000070 IG     PTR   IGM
621 0022C   556  2 5C220030 IG1    LDX   4,DELT,M     (XR4)=ADDRESS OF DELT
622 0022E   558  2 5C2A000A        LDX   5,10,M       INITIALIZE INDEX
623 00230   560  2 16800000 IG1A   LDA   GXDT,5
624 00232   562  2 5680FFFE        LDB   GXDT-2,5
625 00234   564  2 64040000        JS    MULFD        GXDT(I)*DELT  I=1,3
626 00236   566  2 9E80003C        AFD   DVX-2,5
627 00238   568  2 9E800012        AFD   VX-2,5
628 0023A   570  2 3E800014        STA   VX,5         VX(I)=GXDT(I)+DVX(I)
629 0023C   572  2 7E800012        STB   VX-2,5
630 0023E   574  2 9E80002A        AFD   LDVX-2,5
631 00240   576  2 64040000        JS    MULFD        DELT*(LDVX(I)+VX(I))
632 00242   578  2 9E8000BE        AFD   X-2,5
633 00244   580  2 3E8000C0        STA   X,5          X(I)=X(I)+(DELT*LDVX(I)+VX(I))
634 00246   582  2 7E8000BE        STB   X-2,5
635 00248   584  2 6C2B0004        IMN   5,4,M
636 0024A   586  2 64300230        JGU   IG1A
637 0024C   588  2 74000070        RTA   IGM
```

```
VERSION K20A0503      DECK NAME=*NAV   *                                                                      PAGE  17

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
                                                   *
                                                   *
                                                   *    LATITUDE AND LONGITUDE COMPUTATION
                                                   *
            639                                          EVEN
            640 0024E     590  2 00000070 IH             PTR    IHM
            641 00250     592  2 140000C2 IH1            LDA    X+2
            642 00252     594  2 540000C0                LDB    X
            643 00254     596  2 5C2200C0                LDX    4,X,M
            644 00256     598  2 64040000                JS     MULFD          X**2
            645 00258     600  2 3C0000AA                STA    TEM+2
            646 0025A     602  2 7C0000A8                STB    TEM            SAVE IT
            647 0025C     604  2 140000C6                LDA    Y+2
            648 0025E     606  2 540000C4                LDB    Y
            649 00260     608  2 5C2200C4                LDX    4,Y,M
            650 00262     610  2 64040000                JS     MULFD          Y**2
            651 00264     612  2 9C0000A8                AFD    TEM            X**2+Y**2
            652 00266     614  2 3C0000AA                STA    TEM+2
            653 00268     616  2 7C0000A8                STB    TEM            SAVE X**2+Y**2
                                                   *
            654 0026A     618  2 64040000                JS     DECSQ          SQRT(X**2+Y**2)
                                                   *
            655 0026C     620  2 3C0000B6                STA    TEM0+2
            656 0026E     622  2 7C0000B4                STB    TEM0           SAVE IT
            657 00270     624  2 140000CA                LDA    Z+2
            658 00272     626  2 540000C8                LDB    Z
            659 00274     628  2 5C22002C                LDX    4,KGDL,M
            660 00276     630  2 64040000                JS     MULFD          Z*KGDL
            661 00278     632  2 3C0000BA                STA    TEM1+2
            662 0027A     634  2 7C0000B8                STB    TEM1
            663 0027C     636  2 5C2200B4                LDX    4,TEM0,M
                                                   *
            664 0027E     638  2 64040000                JS     DECATN         ATAN((Z*KGDL)/SQRT(X**2+Y**2))
                                                   *
            665 00280     640  2 9C000024                AFD    LATB           LATB+ATAN((Z*KGDL)/SQRT(X**2+Y**2))
            666 00282     642  2 3C00000A                STA    LAT+2
            667 00284     644  2 7C000008                STB    LAT
                                                   *
            668 00286     646  2 0400     IH2            CFX
            669 00287     647  2     0C02                SRAD   2              SCALE TO 2**-30
            670 00288     648  2 7C010079                STBH   042+1          042 DATA = MSH OF LATITUDE
            671 0028A     650  2 0810                    SLLD   16
GENERATED                            0700
            672 0028C     652  2 7C01007B                STBH   043+1          043 DATA = LSH OF LATITUDE
                                                   *
            673 0028E     654  2 1400005A IH3            LDA    TIME+2
            674 00290     656  2 54000058                LDB    TIME
            675 00292     658  2 DC00005C                SFD    T0             (TIME-T0)
            676 00294     660  2 5C220028                LDX    4,OMEG,M
            677 00296     662  2 64040000                JS     MULFD          (TIME-T0)*OMEG
            678 00298     664  2 DC000028                SFD    LG0            ((TIME-T0)*OMEG)-LG0
            679 0029A     666  2 3C0000BA                STA    TEM1+2
            680 0029C     668  2 7C0000B8                STB    TEM1
            681 0029E     670  2 140000C6                LDA    Y+2
```

```
VERSION K20A0503      DECK NAME=*NAV   *

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
            682 002A0    672  2 540000C4          LDB    Y
            683 002A2    674  2 5C2200C0          LDX    4,X,M
                                       *
            684 002A4    676  2 64040000          JS     DECATN      ATAN(Y/X)
                                       *
            685 002A6    678  2 9C000020          AFD    LONB        LONB+ATAN(Y/X)
            686 002A8    680  2 3C0000BE          STA    TEM2+2
            687 002AA    682  2 7C0000BC          STB    TEM2
            688 002AC    684  2 DC000088          SFD    TEM1        (LONB+ATAN(Y/X))-(((TIME-T0)*OMEG)-LGO)
            689 002AE    686  2 3C00000E          STA    LONG+2
            690 002B0    688  2 7C00000C          STB    LONG
                                       *
            691 002B2    690  2 0400       IH4    CFX
            692 002B3    691  2     0C02          SRAD   2           SCALE TO 2**-30
            693 002B4    692  2 7C01007D          STBH   044+1       044 DATA = MSH OF LONGITUDE
            694 002B6    694  2 0810              SLLD   16
GENERATED                           0700
            695 002B8    696  2 7C01007F          STBH   045+1       045 DATA = LSH OF LONGITUDE
                                       *
            696 002BA    698  2 140000BE IH5      LDA    TEM2+2      (A,B)=LONB+ATAN(Y/X)
            697 002BC    700  2 540000BC          LDB    TEM2
                                       *
            698 002BE    702  2 64040000          JS     SINCOS
            699 002C0    704  2 6004              JRU    *+4
GENERATED                           0700
            700 002C2    706  2 00000028          PTR    SCLG        SCLG=SIN(LONB+ATAN(Y/X))
                                       *
            701 002C4    708  2 7C000024 IH6      STB    CCLG        CCLG=COS(LONB+ATAN(Y/X))
            702 002C6    710  2 3C000026          STA    CCLG+2
            703 002C8    712  2 1400008A IH7      LDA    TEM1+2      (A,B)=((TIME-T0)*OMEG)-LGO
            704 002CA    714  2 54000088          LDB    TEM1
                                       *
            705 002CC    716  2 64040000          JS     SINCOS
            706 002CE    718  2 6004              JRU    *+4
GENERATED                           0700
            707 002D0    720  2 00000000          PTR    SWT         SWT=SIN(((TIME-T0)*OMEG)-LGO)
                                       *
            708 002D2    722  2 7C000004 IH8      STB    CWT         CWT=COS(((TIME-T0)*OMEG)-LGO)
            709 002D4    724  2 3C000006          STA    CWT+2
            710 002D6    726  2 140000CA IH9      LDA    Z+2
            711 002D8    728  2 540000C8          LDB    Z
            712 002DA    730  2 5C2200C8          LDX    4,Z,M
            713 002DC    732  2 64040000          JS     MULFD       Z**2
            714 002DE    734  2 9C0000A8          AFD    TEM         (X**2+Y**2+Z**2)
                                       *
            715 002E0    736  2 64040000          JS     DECSQ       SQRT(X**2+Y**2+Z**2)
                                       *
            716 002E2    738  2 3C000006          STA    RXYZ+2      RXYZ=SQRT(X**2+Y**2+Z**2)
            717 002E4    740  2 7C000004          STB    RXYZ
            718 002E6    742  2 140000CA IH10     LDA    Z+2
            719 002E8    744  2 540000C8          LDB    Z
            720 002EA    746  2 5C220004          LDX    4,RXYZ,M
            721 002EC    748  2 64040000          JS     DVFD        Z/RXYZ
            722 002EE    750  2 3C000036          STA    SGCL+2      SGCL=Z/RXYZ
            723 002F0    752  2 7C000034          STB    SGCL
```

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VERSION K20A0503      DECK NAME=*NAV    *                                                          PAGE  19

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
            724 002F2   754  2 5C220034 IH12   LDX    4,SGCL,M
            725 002F4   756  2 64040000          JS     MULFD        SGCL**2
            726 002F6   758  2 3C00002E          STA    S2GC+2       S2GC=SGCL**2
            727 002F8   760  2 7C00002C          STB    S2GC
            728 002FA   762  2 14000086 IH11   LDA    TEMU+2
            729 002FC   764  2 54000084          LDB    TEMU
            730 002FE   766  2 5C220004          LDX    4,RXYZ,M
            731 00300   768  2 64040000          JS     DVFD         SQRT(X**2+Y**2)/RXYZ
            732 00302   770  2 3C00003A          STA    CGCL+2       CGCL=SQRT(X**2+Y**2)/RXYZ
            733 00304   772  2 7C000038          STB    CGCL
            734 00306   774  2 5C220038 IH13   LDX    4,CGCL,M
            735 00308   776  2 64040000          JS     MULFD        CGCL**2
            736 0030A   778  2 3C000032          STA    C2GC+2       C2GC=CGCL**2
            737 0030C   780  2 7C000030          STB    C2GC
            738 0030E   782  2 1400000A IH14    LDA    LAT+2
            739 00310   784  2 54000008           LDB    LAT
                                          *
                                          *
            740 00312   786  2 64040000          JS     SINCOS
            741 00314   788  2 6004              JRU    *+4
GENERATED                        0700
            742 00316   790  2 00000008          PTR    SGDL         SGDL=SIN(LAT)
                                          *
            743 00318   792  2 3C00000E          STA    CGDL+2       CGDL=COS(LAT)
            744 0031A   794  2 7C00000C IH15   STB    CGDL
            745 0031C   796  2 74000070          RTA    IHM
```

```
VERSION K20A0503      DECK NAME=*NAV    *                                                              PAGE  20
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
                                          *
                                          *
                                          *      COMPUTATION OF LOCAL VERTICAL CO-ORDINATES
                                          *      VV,VE,AND VN, AND GROUND SPEED
                                          *
                                          *
            747                                    EVEN
            748 0031E    798  2 00000070 IJ        PTR    IJ4
            749 00320    800  2 5C2A000C IJ1       LDX    5,A,M         XR5=ADDRESS OF MATRIX A
            750 00322    802  2 1400001C           LDA    ZERO
            751 00324    804  2 3A8F               STA    30,5          INSERT ZERO INTO A(2,3)
            752 00325    805  2     3A8E           STA    28,5
            753 00326    806  2 1400000A           LDA    SGDL+2
            754 00328    808  2 54000008           LDB    SGDL
            755 0032A    810  2 3A8D               STA    26,5          INSERT SGDL INTO A(1,3)
            756 0032B    811  2     7A8C           STB    24,5
            757 0032C    812  2 1400001C           LDA    ZERO
            758 0032E    814  2 5400001C           LDB    ZERO
            759 00330    816  2 DC000008           SFD    SGDL          ZERO - SGDL = -SGDL
            760 00332    818  2 5C220024           LDX    4,CCLG,M
            761 00334    820  2 64040000           JS     MULFD         -SGDL*CCLG
            762 00336    822  2 3A85               STA    10,5
            763 00337    823  2     7A84           STB    8,5           A(3,1) = -SGDL*CCLG
            764 00338    824  2 1201               LDA    2,4
            765 00339    825  2     5200           LDB    0,4
            766 0033A    826  2 3A89               STA    18,5
            767 0033B    827  2     7A88           STB    16,5          A(2,2) = CCLG
            768 0033C    828  2 1400000E           LDA    CGDL+2
            769 0033E    830  2 5400000C           LDB    CGDL
            770 00340    832  2 3A91               STA    34,5          A(3,3) = CGDL
            771 00341    833  2     7A90           STB    32,5
            772 00342    834  2 64040000           JS     MULFD         CGDL*CCLG
            773 00344    836  2 3A81               STA    2,5
            774 00345    837  2     7A80           STB    0,5           A(1,1) = CGDL*CCLG
            775 00346    838  2 5C220028           LDX    4,SCLG,M
            776 00348    840  2 1291               LDA    34,5
            777 00349    841  2     5290           LDB    32,5
            778 0034A    842  2 64040000           JS     MULFD         CGDL*SCLG
            779 0034C    844  2 3A87               STA    14,5
            780 0034D    845  2     7A86           STB    12,5          A(1,2) = CGDL*SCLG
            781 0034E    846  2 1400001C           LDA    ZERO
            782 00350    848  2 5400001C           LDB    ZERO
            783 00352    850  2 DC000028           SFD    SCLG          ZERO - SCLG = -SCLG
            784 00354    852  2 3A83               STA    6,5           A(2,1) = -SCLG
            785 00355    853  2     7A82           STB    4,5
            786 00356    854  2 5C220008           LDX    4,SGDL,M
            787 00358    856  2 64040000           JS     MULFD         -SGDL*SCLG
            788 0035A    858  2 3A8B               STA    22,5
            789 0035B    859  2     7A8A           STB    20,5          A(3,2) = -SGDL*SCLG
            790 0035C    860  2 5C2A0150           LDX    5,AP,M        INITIALIZE POINTER TO VECTOR AP
            791 0035E    862  2 140000C6           LDA    Y+2
            792 00360    864  2 540000C4           LDB    Y
            793 00362    866  2 5C220024           LDX    4,OMGA,M
            794 00364    868  2 64040000           JS     MULFD         Y*OMGA
```

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VERSION K20A0503      DECK NAME=*NAV   *                                                                PAGE  21

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                             SOURCE
            795 00366   870  2 9C000014           AFD    VX          VX+Y*OMGA
            796 00368   872  2 3A81               STA    2,5         INSERT VX+Y*OMGA INTO AP(1)
            797 00369   873  2     7A80           STB    0,5
            798 0036A   874  2 140000C2           LDA    X+2
            799 0036C   876  2 540000C0           LDB    X
            800 0036E   878  2 64040000           JS     MULFD       X*OMGA
            801 00370   880  2 3C0000AA           STA    TEM+2       STORE X*OMGA IN TEMP LOCATION
            802 00372   882  2 7C0000A8           STB    TEM
            803 00374   884  2 1400001A           LDA    VY+2        LOAD VY INTO (A,B)
            804 00376   886  2 54000018           LDB    VY
            805 00378   888  2 DC0000A8           SFD    TEM         VY-X*OMGA
            806 0037A   890  2 3A83               STA    6,5         INSERT VY-X*OMGA INTO AP(2)
            807 0037B   891  2     7A82           STB    4,5
            808 0037C   892  2 1400001E           LDA    VZ+2
            809 0037E   894  2 5400001C           LDB    VZ
            810 00380   896  2 3A85               STA    10,5        INSERT VZ INTO AP(3)
            811 00381   897  2     7A84           STB    8,5
                                          *
                                          *
            812 00382   898  2 64040000           JS     MULD31
            813 00384   900  2 6008               JRU    *+8
GENERATED                          0700
            814 00386   902  2 0000000C           PTR    A
            815 00388   904  2 00000150           PTR    AP
            816 0038A   906  2 0000004C           PTR    VV
                                          *
                                          *
            817 0038C   908  2 5C2A012C IJ2       LDX    5,TM,M
            818 0038E   910  2 1400001C           LDA    ZERO
            819 00390   912  2 3A8C               STA    24,5        TM(1,3)=TM(2,3)=TM(3,1)=TM(3,2)=0
            820 00391   913  2     3A8D           STA    26,5
            821 00392   914  2 3A8E               STA    28,5
            822 00393   915  2     3A8F           STA    30,5
            823 00394   916  2 3A84               STA    8,5
            824 00395   917  2     3A85           STA    10,5
            825 00396   918  2 3A8A               STA    20,5
            826 00397   919  2     3A8B           STA    22,5
            827 00398   920  2 5400001E           LDB    FONE
            828 0039A   922  2 7A91               STB    34,5        INSERT 1.0 INTO TM(3,3)
            829 0039B   923  2     3A90           STA    32,5
            830 0039C   924  2 14000006           LDA     CWT+2
            831 0039E   926  2 54000004           LDB    CWT
            832 003A0   928  2 3A81               STA    2,5         INSERT CWT INTO TM(1,1) AND TM(2,2)
            833 003A1   929  2     7A80           STB    0,5
            834 003A2   930  2 3A89               STA    18,5
            835 003A3   931  2     7A88           STB    16,5
            836 003A4   932  2 14000002           LDA    SWT+2
            837 003A6   934  2 54000000           LDB    SWT
            838 003A8   936  2 3A87               STA    14,5        INSERT SWT INTO TM(1,2)
            839 003A9   937  2     7A86           STB     12,5
            840 003AA   938  2 1400001C           LDA    ZERO
            841 003AC   940  2 5400001C           LDB    ZERO
            842 003AE   942  2 DC000000           SFD    SWT         ZERO - SWT = -SWT
            843 003B0   944  2 3A83               STA    6,5         INSERT -SWT INTO TM(2,1)
            844 003B1   945  2     7A82           STB    4,5
```

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VERSION K20A0503      DECK NAME=*NAV   *                                                          PAGE  22

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                SOURCE
                                        *
                                        *
          845 003B2    946  2 64040000         JS     MULD31
          846 003B4    948  2 6008             JRU    *+8
GENERATED                        0700
          847 003B6    950  2 0000012C         PTR    TM
          848 003B8    952  2 00000150         PTR    AP
          849 003BA    954  2 0000005A         PTR    VXE
                                        *
                                        *
          850 003BC    956  2 5C2A0000 IJ3     LDX    5,0,M
          851 003BE    958  2 5C220001         LDX    4,1,M
          852 003C0    960  2 1680004E IJ3A    LDA    VV+2,5
          853 003C2    962  2 5680004C         LDB    VV,5
          854 003C4    964  2 0400             CFX
          855 003C5    965  2     0803         SLLD   3            SCALE TO 2**-19
          856 003C6    966  2 7E010082         STBH   048,4        048,04A,OR 04C=LSH OF VELOCITY
          857 003C8    968  2 0870             SRLD   16
GENERATED                        0700
          858 003CA    970  2 7E010080         STBH   047,4        047,049,OR 04B=MSH OF VELOCITY
          859 003CC    972  2 6C2A0004         IMP    5,4,M
          860 003CE    974  2 6C220004         IMP    4,4,M
          861 003D0    976  2 2428000C         ICL    5,12,M
          862 003D2    978  2 643003D6         JGU    IJ4
          863 003D4    980  2 643003C0         JGU    IJ3A
                                        *
          864 003D6    982  2 1400001C IJ4     LDA    ZERO
          865 003D8    984  2 3C00006A         STA    VEL2
          866 003DA    986  2 3C00006C         STA    VEL2+2       SET VEL2 TO ZERO
          867 003DC    988  2 5C28001A         LDX    5,TEN
          868 003DE    990  2 5EA2004A IJ4A    LDX    4,VV-2,5,M   XR4 = BASE FOR VECTOR VV
          869 003E0    992  2 5680004A         LDB    VV-2,5       LOAD V(I) INTO (A,B)
          870 003E2    994  2 1680004C         LDA    VV,5
          871 003E4    996  2 64040000         JS     MULFD        VV*VV OR VE*VE OR VN*VN
          872 003E6    998  2 3E8000A8         STA    TEM,5
          873 003E8   1000  2 7E8000A6         STB    TEM-2,5      STORE V(I)*V(I) IN A TEMP LOCATION
          874 003EA   1002  2 9C00006A         AFD    VEL2         VEL2=VV*VV+VE*VE+VN*VN
          875 003EC   1004  2 3C00006C         STA    VEL2+2
          876 003EE   1006  2 7C00006A         STB    VEL2         STORE VEL2 SUM
          877 003F0   1008  2 6C290010         IMN    5,FOUR       DECREMENT POINTER FOR NEXT ELEMENT
          878 003F2   1010  2 643003DE         JGU    IJ4A
          879 003F4   1012  2 1400006C IJ5     LDA    VEL2+2
          880 003F6   1014  2 5400006A         LDB    VEL2
          881 003F8   1016  2 DC0000A8         SFD    TEM          VEL2-VV*VV
                                        *
                                        *
          882 003FA   1018  2 64040000         JS     DECSQ
                                        *
                                        *
          883 003FC   1020  2 3C000068         STA    GS+2         GS=SQRT(VEL2-VV*VV)
          884 003FE   1022  2 7C000066         STB    GS
                                        *
                                        *
          885 00400   1024  2 64040000 IJ6     JS     MUL33        VI(I,J)=A(I,J)AJ(I,J)
          886 00402   1026  2 6008             JRU    *+8
```

VERSION K20A0503 DECK NAME=*NAV *

SOURCE

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM
GENERATED                          0700
              887 00404   1028  2 0000000C      PTR     A
              888 00406   1030  2 000000F2      PTR     AJ
              889 00408   1032  2 00000084      PTR     VI
              890 0040A   1034  2 74000070      RTA     IJM
```

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VERSION K2040503      DECK NAME=*NAV    *                                                                  PAGE  24

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                           SOURCE
                                                   *
                                                   *           GYRO DRIFT COMPENSATION COMPUTATION
                                                   *
                                                   *     THIS ROUTINE IS EXECUTED ONCE EVERY SECOND DURING BOTH ALIGN
                                                   *     AND NAV. THE EXECUTION CYCLE IS SET BY A CONSTANT,DCON,WHICH IS
                                                   *     INITIALIZED TO -8.
                                                   *
            892                                        EVEN
            893 0040C   1036  2 00000070 IL            PTR    ILM
            894 0040E   1038  2 64040000 IL1           JS     VECADD          SDV(I)=SDV(I)+DVX(I)
            895 00410   1040  2 6008                   JRU    *+8
GENERATED                         0700
            896 00412   1042  2 00000000               PTR    DVXI
            897 00414   1044  2 000000CC               PTR    SDVI
            898 00416   1046  2 000000CC               PTR    SDVI
                                                   *
            899 00418   1048  2 1400000A IL2           LDA    ONE
            900 0041A   1050  2 A4000010               ADD    DCON
            901 0041C   1052  2 3C000010               STA    DCON            DCON = DCON+1
            902 0041E   1054  2 67200630 IL3           JL     IL15            JUMP OUT IF DCON < 0
            903 00420   1056  2 14000002 IL4           LDA    DCSK            DCON=-8
            904 00422   1058  2 3C000010               STA    DCON
            905 00424   1060  2 14000002 IL5           LDA    SRT1+2          DIVIDEND IN (A,B)
            906 00426   1062  2 54000000               LDB    SRT1
            907 00428   1064  2 5C22001C               LDX    4,DTDC,M        (XR4)=ADDRESS OF DIVISOR
            908 0042A   1066  2 64040000               JS     DVFD            SRT1=SRT1/DTDC
            909 0042C   1068  2 3C000002               STA    SRT1+2
            910 0042E   1070  2 7C000000               STB    SRT1
            911 00430   1072  2 14000006               LDA    SRT2+2
            912 00432   1074  2 54000004               LDB    SRT2
            913 00434   1076  2 64040000               JS     DVFD            SRT2=SRT2/DTDC
            914 00436   1078  2 3C000006               STA    SRT2+2
            915 00438   1080  2 7C000004               STB    SRT2
            916 0043A   1082  2 5C220052 IL6           LDX    4,DC04,M
            917 0043C   1084  2 64040000               JS     DVFD            SRT2/DC04
            918 0043E   1086  2 3C0000AA               STA    TEM+2           SAVE SRT2/DC04
            919 00440   1088  2 7C0000A8               STB    TEM
            920 00442   1090  2 14000002               LDA    SRT1+2
            921 00444   1092  2 54000000               LDB    SRT1
            922 00446   1094  2 64040000               JS     DVFD            SRT1/DC04
            923 00448   1096  2 3C0000B6               STA    TEM0+2          SAVE SRT1/DC04
            924 0044A   1098  2 7C0000B4               STB    TEM0
            925 0044C   1100  2 5C2200B4               LDX    4,TEM0,M
            926 0044E   1102  2 64040000               JS     MULFD           (SRT1/DC04)**2
            927 00450   1104  2 3C0000B6               STA    TEM0+2          SAVE (SRT1/DC04)**2
            928 00452   1106  2 7C0000B4               STB    TEM0
            929 00454   1108  2 140000AA               LDA    TEM+2
            930 00456   1110  2 540000A8               LDB    TEM
            931 00458   1112  2 5C2200A8               LDX    4,TEM,M
            932 0045A   1114  2 64040000               JS     MULFD           (SRT2/DC04)**2
            933 0045C   1116  2 3C0000AA               STA    TEM+2
            934 0045E   1118  2 7C0000A8               STB    TEM             SAVE (SRT2/DC04)**2
            935 00460   1120  2 1400001E               LDA    FONE            LOAD A WITH 1.0. COMPUTE F1
            936 00462   1122  2 5400001C               LDB    ZERO
```

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VERSION K20A0503      DECK NAME=*NAV   *                                                                PAGE  25

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
            937 00464   1124  2 DC000084            SFD     TEM0          F1=1.0-(SRT1/DC04)**2
            938 00466   1126  2 3C000046            STA     F1+2
            939 00468   1128  2 7C000044            STB     F1
            940 0046A   1130  2 1400001E            LDA     FONE          COMPUTE F2
            941 0046C   1132  2 5400001C            LDB     ZERO
            942 0046E   1134  2 DC0000A8            SFD     TEM           F2=1.0-(SRT2/DC04)**2
            943 00470   1136  2 3C00004A            STA     F2+2
            944 00472   1138  2 7C000048            STB     F2
                                          *
                                          *    ACCELEROMETER TO GYRO CO-ORDINATE ROTATION
                                          *
            945 00474   1140  2 64040000 IL7        JS      MULD31        DV(I)=R45M(I,J)*SDV(I)
            946 00476   1142  2 6008                JRU     *+8
GENERATED                          0700
            947 00478   1144  2 00000000            PTR     R45M
            948 0047A   1146  2 000000CC            PTR     SDVI
            949 0047C   1148  2 00000038            PTR     DVI
                                          *
                                          *
                                          *   G INDEPENDENT, SPEED INDEPENDENT
                                          *
            950 0047E   1150  2 5C2A0150 IL8        LDX     5,AP,M        XR5= BASE FOR MATRIX AP
            951 00480   1152  2 1400007A            LDA     CD16+2
            952 00482   1154  2 54000078            LDB     CD16
            953 00484   1156  2 3A81                STA     2,5           AP(1)=CD16
            954 00485   1157  2     7A80            STB     0,5
            955 00486   1158  2 14000082            LDA     CD18+2
            956 00488   1160  2 54000080            LDB     CD18
            957 0048A   1162  2 3A83                STA     6,5           AP(2)=CD18
            958 0048B   1163  2     7A82            STB     4,5
            959 0048C   1164  2 1400007E            LDA     CD17+2
            960 0048E   1166  2 5400007C            LDB     CD17
            961 00490   1168  2 3A85                STA     10,5          AP(3)=CD17
            962 00491   1169  2     7A84            STB     8,5
            963 00492   1170  2 5C22001C            LDX     4,DTDC,M      (XR4)= ADDRESS OF DTDC
            964 00494   1172  2 5C28001A            LDX     5,TEN         INITIALIZE POINTER TO VECTOR AP(I)
            965 00496   1174  2 16800150 IL8A       LDA     AP,5
            966 00498   1176  2 5680014E            LDB     AP-2,5
            967 0049A   1178  2 64040000            JS      MULFD         DTDC*AP(I)
            968 0049C   1180  2 3E800150            STA     AP,5
            969 0049E   1182  2 7E80014E            STB     AP-2,5
            970 004A0   1184  2 6C290010            IMN     5,FOUR          DECREMENT POINTER FOR NEXT ARGUEMENT
            971 004A2   1186  2 64300496            JGU     IL8A
            972 004A4   1188  2 5C220008            LDX     4,RATM,M
            973 004A6   1190  2 140000AE            LDA     CD29+2
            974 004A8   1192  2 540000AC            LDB     CD29
            975 004AA   1194  2 64040000            JS      MULFD         CD29*RATM
            976 004AC   1196  2 3C0000AA            STA     TEM+2
            977 004AE   1198  2 7C0000A8            STB     TEM           SAVE CD29*RATM
            978 004B0   1200  2 5C22000C            LDX     4,RATP,M
            979 004B2   1202  2 140000AA            LDA     CD28+2
            980 004B4   1204  2 540000A8            LDB     CD28
            981 004B6   1206  2 64040000            JS      MULFD         CD28*RATP
            982 004B8   1208  2 DC0000A8            SFD     TEM           CD28*RATP-CD29*RATM
            983 004BA   1210  2 9C000154            AFD     AP+4
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
             984 004BC   1212  2 3C000156          STA    AP+6          AP(2)=AP(2)+(CD28*RATP-CD29*RATM)
             985 004BE   1214  2 7C000154          STB    AP+4
                                      *
                                      *
                                      *   G DEPENDENT, SPEED INDEPENDENT
                                      *
             986 004C0   1216  2 64040000 IL9     JS     MULD31         AT(I)=GM(I,J)*DV(I)
             987 004C2   1218  2 6008             JRU    *+8
GENERATED                          0700
             988 004C4   1220  2 00000060          PTR    GM
             989 004C6   1222  2 00000038          PTR    DVI
             990 004C8   1224  2 0000015C          PTR    AT
                                      *
             991 004CA   1226  2 64040000          JS     VECADD         AP(I)=AP(I)+AT(I)
             992 004CC   1228  2 6008             JRU    *+8
GENERATED                          0700
             993 004CE   1230  2 0000015C          PTR    AT
             994 004D0   1232  2 00000150          PTR    AP
             995 004D2   1234  2 00000150          PTR    AP
                                      *
                                      *   G INDEPENDENT, SPEED DEPENDENT
                                      *
             996 004D4   1236  2 5C2A015C IL10      LDX    5,AT,M         XR5= BASE FOR VECTOR AT
             997 004D6   1238  2 5C220044          LDX    4,F1,M
             998 004D8   1240  2 140000B2          LDA    CD30+2
             999 004DA   1242  2 540000B0          LDB    CD30
            1000 004DC   1244  2 64040000          JS     MULFD          CD30*F1
            1001 004DE   1246  2 3A81              STA    2,5
            1002 004DF   1247  2      7A80         STB    0,5            INSERT CD30*F1 INTO AT(1)
            1003 004E0   1248  2 140000B6          LDA    CD31+2
            1004 004E2   1250  2 540000B4          LDB    CD31
            1005 004E4   1252  2 64040000          JS     MULFD          CD31*F1
            1006 004E6   1254  2 3A85              STA    10,5
            1007 004E7   1255  2      7A84         STB    8,5            INSERT CD31*F1 INTO AT(3)
            1008 004E8   1256  2 5C220008          LDX    4,RATM,M        ADDRESS OF RATM IN XR4
            1009 004EA   1258  2 140000E6          LDA    CD43+2
            1010 004EC   1260  2 540000E4          LDB    CD43
            1011 004EE   1262  2 64040000          JS     MULFD          CD43*RATM
            1012 004F0   1264  2 3C0000AA          STA    TEM+2
            1013 004F2   1266  2 7C0000A8          STB    TEM            SAVE CD43*RATM
            1014 004F4   1268  2 5C22000C          LDX    4,RATP,M       ADDRESS OF RATP IN XR4
            1015 004F6   1270  2 140000E2          LDA    CD42+2
            1016 004F8   1272  2 540000E0          LDB    CD42
            1017 004FA   1274  2 64040000          JS     MULFD          CD42*RATP
            1018 004FC   1276  2 DC0000A8          SFD    TEM            (CD42*RATP-CD43*RATM)
            1019 004FE   1278  2 3C0000AA          STA    TEM+2
            1020 00500   1280  2 7C0000A8          STB    TEM            SAVE (CD42*RATP-CD43*RATM)
            1021 00502   1282  2 5C220052          LDX    4,DC04,M
            1022 00504   1284  2 14000006          LDA    SRT2+2
            1023 00506   1286  2 54000004          LDB    SRT2
            1024 00508   1288  2 64040000          JS     DVFD           SRT2/DC04
            1025 0050A   1290  2 3C0000B6          STA    TEM0+2
            1026 0050C   1292  2 7C0000B4          STB    TEM0           SAVE (SRT2/DC04)
            1027 0050E   1294  2 1400001E          LDA    FONE
            1028 00510   1296  2 5400001C          LDB    ZERO
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            1029 00512  1298  2 0C000084        SFD   TEM0         (1.0-SRT2/DC04)
            1030 00514  1300  2 3C0000B6        STA   TEM0+2
            1031 00516  1302  2 7C000084        STB   TEM0         SAVE IT
            1032 00518  1304  2 5C220054        LDX   4,TEM0,M
            1033 0051A  1306  2 140000AA        LDA   TEM+2
            1034 0051C  1308  2 540000AB        LDB   TEM
            1035 0051E  1310  2 64040000        JS    MULFD        (1.0-SRT2/DC04)(CD42*RATP-CD43*RATM)
            1036 00520  1312  2 3C0000AA        STA   TEM+2
            1037 00522  1314  2 7C0000AB        STB   TEM          SAVE IT
            1038 00524  1316  2 5C220048        LDX   4,F2,M
            1039 00526  1318  2 1400008A        LDA   CD32+2
            1040 00528  1320  2 540000B6        LDB   CD32
            1041 0052A  1322  2 64040000        JS    MULFD        F2*CD32
            1042 0052C  1324  2 9C0000AB        AFD   TEM
            1043 0052E  1326  2 3A83            STA   6,5          STORE F2*CD32*(1-SRT2/DC04)
                                *                                  *(CD42*RATP-CD43*RATM) IN AT(2)
            1044 0052F  1327  2      7482       STB   4,5
                                *
            1045 00530  1328  2 64040000        JS    VECADD       AP(I)=AP(I)+AT(I)
            1046 00532  1330  2 6006            JRU   *+6
GENERATED                           0700
            1047 00534  1332  2 00000150        PTR   AT
            1048 00536  1334  2 00000150        PTR   AP
            1049 00538  1336  2 00000150        PTR   AP
                                *
                                *   G AND SPEED DEPENDENT
                                *
                                *
                                *   COMPUTE ELEMENTS FOR ROWS 1 & 3 AND INSERT IN A(I,J)
                                *
            1050 0053A  1338  2 5C2A000C IL11   LDX   5,A,M        XR5= BASE FOR MATRIX A(I,J)
            1051 0053C  1340  2 1400001A        LDA   TEN
            1052 0053E  1342  2 3C000058        STA   IND          INITIALIZE INDICATOR
            1053 00540  1344  2 5C220044        LDX   4,F1,M
            1054 00542  1346  2 5C18001C        LDA   3,ZERO       COUNTER FOR CDXX
            1055 00544  1348  2 598000BC IL11A  LDB   CD33,3       LOAD (A,B) WITH CDXX
            1056 00546  1350  2 158000BE        LDA   CD33+2,3
            1057 00548  1352  2 64040000        JS    MULFD        F1*CDXX
            1058 0054A  1354  2 3A81            STA   2,5
            1059 0054B  1355  2      7A80       STB   0,5          STORE IN A(I,J)
            1060 0054C  1356  2 6C2A000C        IMP   5,12,M       INCREMENT MATRIX POINTER
            1061 0054E  1358  2 6C18001D        IMP   3,FOUR
            1062 00550  1360  2 24190058        ICL   3,IND        CHECK FOR PROPER NUMBER OF ELEMENTS
            1063 00552  1362  2 64300556        JGU   IL11B
            1064 00554  1364  2 64300544        JGU   IL11A
            1065 00556  1366  2 6C24001C IL11B  IMN   5,24,M       DECREMENT XR5 FOR ELEMENTS OF ROW 3
            1066 00558  1368  2 14000058        LDA   IND
            1067 0055A  1370  2 A4020000        ADU   12,M         INCREMENT INDICATOR FOR ROW 3
            1068 0055C  1372  2 3C000058        STA   IND
            1069 0055E  1374  2 E4020022        SBU   34,M         CHECK FOR END OF MATRIX
            1070 00560  1376  2 619C            JN    IL11A
GENERATED                           0700
            1071 00562  1378  2 1400001A        LDA    TEN         RESTORE INDICATOR TO PROPER VALUE
            1072 00564  1380  2 3C000058        STA   IND
            1073 00566  1382  2 0698            LXA   3            XR3=INDEX FOR ROW 2 OF A(I,J)
```

```
VERSION K20A0503      DECK NAME=*NAV   *                                                       PAGE  28

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
GENERATED                              0700
            1074 00568    1384  2 5C2A000C          LDX    5,A,M        RESTORE XRS TO ADDRESS OF A
            1075 0056A    1385  2 6C2A001C          IMP    5,28,M
            1076 0056C    1388  2 1400001C          LDA    ZERO
            1077 0056E    1390  2 5400001C          LDB    ZERO
            1078 00570    1392  2 DC000048          SFD    F2           ZERO - F2 = -F2
            1079 00572    1394  2 3C00004A          STA    TEM+2
            1080 00574    1396  2 7C0000A8          STB    TEM
            1081 00576    1398  2 5C2200A8          LDX    4,TEM,M
            1082 00578    1400  2 15800004 IL11C    LDA    CD39,3
            1083 0057A    1402  2 55800002          LDB    CD39-2,3
            1084 0057C    1404  2 64040000          JS     MULFD        -F2*CDXX
            1085 0057E    1406  2 3A81              STA    2,5
            1086 0057F    1407  2     7A80          STB    0,5          INSERT -F2*CD39 IN A(I,J)
            1087 00580    1408  2 6C2B000C          IMN    5,12,M
            1088 00582    1410  2 6C1B0004          IMN    3,4,M        DECREMENT INDEX
            1089 00584    1412  2 6430057B          JGU    IL11C
                                            *
            1090 00586    1414  2 64040000          JS     MULD31       AT(I)=A(I,J)*DV(I)
            1091 00588    1416  2 6008              JRU    *+8
GENERATED                              0700
            1092 0058A    1418  2 0000000C          PTR    A
            1093 0058C    1420  2 00000038          PTR    DVI
            1094 0058E    1422  2 0000015C          PTR    AT
                                            *
                                            *
            1095 00590    1424  2 64040000          JS     VECADD       AP(I)=AP(I)+AT(I)
            1096 00592    1426  2 6008              JRU    *+8
GENERATED                              0700
            1097 00594    1428  2 0000015C          PTR    AT
            1098 00596    1430  2 00000150          PTR    AP
            1099 00598    1432  2 00000150          PTR    AP
                                            *
                                            *   TRANSFER TO PLATFORM CO-ORDINATES
                                            *
            1100 0059A    1434  2 5C2A000C IL12     LDX    5,A,M
            1101 0059C    1436  2 1400001C          LDA    ZERO
            1102 0059E    1438  2 3A8C              STA    24,5         A(1,3)=A(2,3)=A(3,1)=A(3,2)=0
            1103 0059F    1439  2     3A8D          STA    26,5
            1104 005A0    1440  2 3A8E              STA    28,5
            1105 005A1    1441  2     3A8F          STA    30,5
            1106 005A2    1442  2 3A84              STA    8,5
            1107 005A3    1443  2     3A85          STA    10,5
            1108 005A4    1444  2 3A8A              STA    20,5
            1109 005A5    1445  2     3A8B          STA    22,5
            1110 005A6    1446  2 5C220000          LDX    4,SRT1,M
            1111 005A8    1448  2 14000058          LDA    DC42+2
            1112 005AA    1450  2 54000056          LDB    DC42
            1113 005AC    1452  2 64040000          JS     DVFD         DC42/SRT1
            1114 005AE    1454  2 3A81              STA    2,5
            1115 005AF    1455  2     7A80          STB    0,5          A(1,1)=A(2,1)=DC42/SRT1
            1116 005B0    1456  2 3A83              STA    6,5
            1117 005B1    1457  2     7A82          STB    4,5
            1118 005B2    1458  2 1400005C          LDA    DC43+2
            1119 005B4    1460  2 5400005A          LDB    DC43
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
            1120 005B6   1462  2 64040000          JS     DVFD          DC43/SRT1
            1121 005B8   1464  2 3A91              STA    34,5
            1122 005B9   1465  2     7A90          STB    32,5          A(3,3)=DC43/SRT1
            1123 005BA   1466  2 5C220004          LDX    4,SRT2,M
            1124 005BC   1468  2 1400005B          LDA    DC42+2
            1125 005BE   1470  2 54000056          LDB    DC42
            1126 005C0   1472  2 64040000          JS     DVFD          DC42/SRT2
            1127 005C2   1474  2 3A87              STA    14,5
            1128 005C3   1475  2     7A86          STB    12,5          A(1,2)=DC42/SRT2
            1129 005C4   1476  2 1400001C          LDA    ZERO
            1130 005C6   1478  2 5400001C          LDB    ZERO
            1131 005C8   1480  2 DA86              SFD    12,5          0-(DC42/SRT2)=-(DC42/SRT2)
            1132 005C9   1481  2     3A89          STA    18,5
            1133 005CA   1482  2 7A88              STB    16,5          INSERT IT IN A(2,2)
                                              *
GENERATED                          0700
            1134 005CC   1484  2 64040000          JS     MULD31        AT(I)=A(I,J)*AP(I)
            1135 005CE   1486  2 6008              JRU    *+8
GENERATED                          0700
            1136 005D0   1488  2 0000000C          PTR    A
            1137 005D2   1490  2 00000150          PTR    AP
            1138 005D4   1492  2 0000015C          PTR    AT
                                              *
                                              *
                                              *  CONSTRUCT UPDATE MATRIX DCAR
                                              *
                                              *
            1139 005D6   1494  2 5C2A000C IL13     LDX    5,DCAR,M
            1140 005D8   1496  2 1400001C          LDA    ZERO
            1141 005DA   1498  2 3A80              STA    0,5           DCAR(1,1)=DCAR(2,2)=DCAR(3,3)=0
            1142 005DB   1499  2     3A81          STA    2,5
            1143 005DC   1500  2 3A88              STA    16,5
            1144 005DD   1501  2     3A89          STA    18,5
            1145 005DE   1502  2 3A90              STA    32,5
            1146 005DF   1503  2     3A91          STA    34,5
                                              *
                                              *
                                              *  STORE NEGATIVE VALUES OF ANGLES IN AP(I)
                                              *
            1147 005E0   1504  2 5C28001A          LDX    5,TEN
            1148 005E2   1506  2 1400001C IL13B    LDA    ZERO
            1149 005E4   1508  2 5400001C          LDB    ZERO
            1150 005E6   1510  2 DE80015A          SFD    AT-2,5        ZERO - PHI = -PHI
            1151 005E8   1512  2 3E800150          STA    AP,5
            1152 005EA   1514  2 7E80014E          STB    AP-2,5        STORE ANGLE IN AP(I)
            1153 005EC   1516  2 6C290010          IMN    5,FOUR        DECREMENT POINTER FOR NEXT ANGLE
            1154 005EE   1518  2 643005E2          JGU    IL13B
            1155 005F0   1520  2 5C2A000C          LDX    5,DCAR,M      XR5= POINTER TO MATRIX DCAR
            1156 005F2   1522  2 5C22015C          LDX    4,AT,M        XR4= POINTER TO VECTOR AT
            1157 005F4   1524  2 5200              LDB    0,4
            1158 005F5   1525  2     1201          LDA    2,4
            1159 005F6   1526  2 7A8A              STB    20,5          INSERT PHI(X) IN DCAR(3,2)
            1160 005F7   1527  2     3A8B          STA    22,5
            1161 005F8   1528  2 5202              LDB    4,4
            1162 005F9   1529  2     1203          LDA    6,4
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                    SOURCE
            1163 005FA   1530  2 7A8C          STB   24,5     INSERT PHIY IN DCAR(1,3)
            1164 005FB   1531  2     3A8D      STA   26,5
            1165 005FC   1532  2 5204          LDB   8,4
            1166 005FD   1533  2     1205      LDA   10,4
            1167 005FE   1534  2 7A86          STB   12,5     INSERT PHIZ IN DCAR(1,2)
            1168 005FF   1535  2     3A87      STA   14,5
            1169 00600   1536  2 5C220150      LDX   4,AP,M
            1170 00602   1538  2 5200          LDB   0,4
            1171 00603   1539  2     1201      LDA   2,4
            1172 00604   1540  2 7A8E          STB   28,5     INSERT -PHI(X) IN DCAR(2,3)
            1173 00605   1541  2     3A8F      STA   30,5
            1174 00606   1542  2 5202          LDB   4,4
            1175 00607   1543  2     1203      LDA   6,4
            1176 00608   1544  2 7A84          STB   8,5      INSERT -PHIY IN DCAR(3,1)
            1177 00609   1545  2     3A85      STA   10,5
            1178 0060A   1546  2 5204          LDB   8,4
            1179 0060B   1547  2     1205      LDA   10,4
            1180 0060C   1548  2 7A82          STB   4,5      INSERT -PHIZ IN DCAR(2,1)
            1181 0060D   1549  2     3A83      STA   6,5
                                 *
                                 *   INITIALIZE SRT1,SRT2,RATP,RATM,SDVI,SDVJ,SDVK TO ZERO
                                 *
            1182 0060E   1550  2 1400001C IL14  LDA   ZERO
            1183 00610   1552  2 3C000000      STA   SRT1
            1184 00612   1554  2 3C000002      STA   SRT1+2
            1185 00614   1556  2 3C000004      STA   SRT2
            1186 00616   1558  2 3C000006      STA   SRT2+2
            1187 00618   1560  2 3C00000C      STA   RATP
            1188 0061A   1562  2 3C00000E      STA   RATP+2
            1189 0061C   1564  2 3C000008      STA   RATM
            1190 0061E   1566  2 3C00000A      STA   RATM+2
            1191 00620   1568  2 3C0000CC      STA   SDVI
            1192 00622   1570  2 3C0000CE      STA   SDVI+2
            1193 00624   1572  2 3C0000D0      STA   SDVI+4
            1194 00626   1574  2 3C0000D2      STA   SDVI+6
            1195 00628   1576  2 3C0000D4      STA   SDVI+8
            1196 0062A   1578  2 3C0000D6      STA   SDVI+10
            1197 0062C   1580  2 1400000C      LDA   TWO
            1198 0062E   1582  2 3C000012      STA   CHAJ
            1199 00630   1584  2 74000070 IL15  RTA   ILM
```

```
VERSION K2040503     DECK NAME=*NAV   *                                                                PAGE  31
DIAGNOSTICS LINE AURES DADRES LC  PROGRAM                                       SOURCE
                                              *
                                              *   UPDATE AJ AND SA MATRICES
                                              *
                                              *
           1201                                      EVEN
           1202 00632    1586  2 00000070 IM         PTR    IMM
           1203 00634    1588  2 5C280012 IM1        LDX    5,CHAJ          TEST CHAJ FOR VALUE .NE. ZERO
           1204 00636    1590  2 242A0000            ICN    5,0,M
           1205 00638    1592  2 6430066C            JGU    IM5             JUMP OUT IF CHAJ = 0
           1206 0063A    1594  2 1400001C            LDA    ZERO
           1207 0063C    1596  2 3C000012            STA    CHAJ            INITIALIZE CHAJ TO ZERO
                                              *
           1208 0063E    1598  2 64040000 IM2        JS     MUL33           D(I,J)=AJ(I,J)*DCAR(I,J)
           1209 00640    1600  2 6008                JRU    *+8
GENERATED                               0700
           1210 00642    1602  2 000000F2            PTR    AJ
           1211 00644    1604  2 0000000C            PTR    DCAR
           1212 00646    1606  2 000000E4            PTR    D
                                              *
                                              *
           1213 00648    1608  2 64040000            JS     MATDAD          AJ(I,J)=AJ(I,J)+D(I,J)
           1214 0064A    1610  2 6008                JRU    *+8
GENERATED                               0700
           1215 0064C    1612  2 000000F2            PTR    AJ
           1216 0064E    1614  2 000000E4            PTR    D
           1217 00650    1616  2 000000F2            PTR    AJ
                                              *
           1218 00652    1618  2 5C280030 IM3        LDX    5,FLGN
           1219 00654    1620  2 242A0000            ICN    5,0,M           TEST FLGN FOR VALUE = 0
           1220 00656    1622  2 6430066C            JGU    IM5             JUMP OUT IF FLGN = 0
           1221 00658    1624  2 64040000 IM4        JS     MUL33           D(I,J)=SA(I,J)*DCAR(I,J)
           1222 0065A    1626  2 6008                JRU    *+8
GENERATED                               0700
           1223 0065C    1628  2 00000108            PTR    SA
           1224 0065E    1630  2 0000000C            PTR    DCAR
           1225 00660    1632  2 000000E4            PTR    D
                                              *
                                              *
           1226 00662    1634  2 64040000            JS     MATDAD          SA(I,J)=SA(I,J)+D(I,J)
           1227 00664    1636  2 6008                JRU    *+8
GENERATED                               0700
           1228 00666    1638  2 00000108            PTR    SA
           1229 00668    1640  2 000000E4            PTR    D
           1230 0066A    1642  2 00000108            PTR    SA
                                              *
           1231 0066C    1644  2 74000070 IM5        RTA    IMM
           1232 00098     152  2          IIC        EQU    IC
           1233 000BE     190  2          IIE        EQU    ID
           1234 0040C    1036  2          IIF        EQU    IL
           1235 00632    1586  2          IIG        EQU    IM
           1236                                      ENTRY  IIC,IIE,IIF,IIG
```

VERSION K20A0503 DECK NAME=*NAV *

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            1238                                    ENTRY   RTAL
            1239                                    EVEN
                                          *
                                          *          RETURN TO ALIGN DECISION (RTAL)
                                          *
                                          *     THIS ROUTINE IS EXECUTED ONCE EVERY 1/8 SECOND DURING NAV. IF
                                          *     THE SYSTEM MODE SWITCH IS EVER RESET TO AN ALIGN MODE THIS
                                          *     ROUTINE WILL DISABLE NAV AND ENABLE ALIGN. IT WILL ALSO STORE
                                          *     T(0) AS THE TIME THAT THE AJ MATRIX WAS LAST ROTATED FOR
                                          *     EARTH ROTATION.
                                          *
            1240 0066E   1646  2 0000007B RTAL    RTR     INM
                                          **********************
                                          *
                                          *     DPU PROCESSING
                                          *
                                          **********************
            1241 00670   1648  2 1400006C IN1     LDA     MODE
            1242 00672   1650  2 E4000010         SBU     FOUR
                                          *       JRN     IN1A          THIS CODE IS FOR IN AIR ALIGN
                                          *       RTA     IMN           MODE=4...IN AIR ALIGN,NOT IMPLEMENTED
            1243 00674   1652  2 6324     IN1A    JRL     IN3
GENERATED                                   0700
            1244 00676   1654  2 1400005E IN2     LDA     T0+2
            1245 00678   1656  2 5400005C         LDB     T0            MODE > 4
            1246 0067A   1658  2 9C000038         AFD     D3032         SAVT=T0+3/32
            1247 0067C   1660  2 3C000034         STA     SAVT+2
            1248 0067E   1662  2 7C000032         STB     SAVT
            1249 00680   1664  2 5C2A0022         LDX     S,34,M
            1250 00682   1666  2 168000F2 IN2A    LDA     AJ,5
            1251 00684   1668  2 3E800108         STA     SA,5          SA(I,J)=AJ(I,J)
            1252 00686   1670  2 6C280002         IMN     S,2,M
            1253 00688   1672  2 64300682         JGU     IN2A
            1254 0068A   1674  2 64040000         JS      FENT
            1255 0068C   1676  2 14000030         LDA     FLGN
            1256 0068E   1678  2 A400000A         ADU     ONE
            1257 00690   1680  2 3C000030         STA     FLGN          FLGN=FLGN+1
            1258 00692   1682  2 14000006         LDA     NTWO
            1259 00694   1684  2 3C000036         STA     NSCH          NSCH=-2
            1260 00696   1686  2 7400007B         RTA     IN1
            1261 00698   1688  2 1400006C IN3     LDA     MODE          MODE < 4
            1262 0069A   1690  2 3C000064         STA     NAVF          NAVF=MODE
                                          **********************
                                          *
                                          *     TURN OFF INS ALIGN LIGHT (NOT IMPLEMENTED)
                                          *
                                          **********************
            1263 0069C   1692  2 7400007B IN3A    RTA     IN4
```

```
VERSION K2040503      DECK NAME=*NAV    *                                                              PAGE  33

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
                                           *
                                           *    DUMMY SUBROUTINE 'DUMY'
                                           *
            1265                                     ENTRY   DUMY
            1266 0069E    1694  2 00000074 DUMY      PTR     DUMRET
            1267 006A0    1696  2 0700               NOP
            1268 006A1    1697  2     0700           NOP
            1269 006A2    1698  2 74000074           RTA     DUMRET
                                           *
                                           *
            1270 0069E    1694  2          IK        EQU     DUMY
            1271 0069E    1694  2          SPIN      EQU     DUMY
            1272 0069E    1694  2          BITE      EQU     DUMY
            1273 0069E    1694  2          CDPU      EQU     DUMY
            1274 0069E    1694  2          GASC      EQU     DUMY
            1275 0069E    1694  2          TKTH      EQU     DUMY
            1276 0069E    1694  2          TORK      EQU     DUMY
                                           *
            1277                                     ENTRY   SPIN
            1278                                     ENTRY   BITE
            1279                                     ENTRY   CDPU
            1280                                     ENTRY   GASC
            1281                                     ENTRY   TKTH
            1282                                     ENTRY   TORK
```

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VERSION K20A0503      DECK NAME=*NAV    *                                                          PAGE  34

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
                                          *
                                          *   NAVIGATION OUTPUT ROUTINE,NAVO
                                          *
            1284                               ENTRY  NAVO
            1285                               EVEN
            1286 006A4   1700  2 00000078 NAVO  PTR    NAVOR
            1287 006A6   1702  2 1400005A       LDA    TIME+2         PICK UP TIME
            1288 006A8   1704  2 54000058       LDB    TIME
            1289 006AA   1706  2 DC0000D8       SFD    TLPO           GET DELTA T SINCE LAST OUTPUT
            1290 006AC   1708  2 0400           CFX
            1291 006AD   1709  2     06C0       LXA    8              GET INTEGER PART
            1292 006AE   1710  2 24430168       ICL    8,360,M        TEST FOR 360 SECONDS
            1293 006B0   1712  2 643006B4       JGU    NAVO1          GO FILL BUFFER
            1294 006B2   1714  2 74000078       RTA    NAVOR          DELTA T .LT. 360 SECONDS - RETURN
            1295 006B4   1716  2 1400000A NAVO1 LDA    ONE
            1296 006B6   1718  2 A4005100       ADD    DECFLG         INCREMENT PDP-11 FLAG
            1297 006B8   1720  2 3C005100       STA    DECFLG
            1298 006BA   1722  2 1400005A       LDA    TIME+2
            1299 006BC   1724  2 54000058       LDB    TIME
            1300 006BE   1726  2 3C0000DA       STA    TLPO+2         UPDATE OUTPUT FLAG
            1301 006C0   1728  2 7C0000D8       STB    TLPO
            1302 006C2   1730  2 3C005104       STA    BTIME+2        PUT TIME IN BUFFER
            1303 006C4   1732  2 7C005102       STB    BTIME
            1304 006C6   1734  2 1400000A       LDA    LAT+2          PUT LATITUDE IN BUFFER
            1305 006C8   1736  2 54000008       LDB    LAT
            1306 006CA   1738  2 3C005108       STA    BLAT+2
            1307 006CC   1740  2 7C005106       STB    BLAT
            1308 006CE   1742  2 1400000E       LDA    LONG+2         PUT LONGITUDE IN BUFFER
            1309 006D0   1744  2 5400000C       LDB    LONG
            1310 006D2   1746  2 3C00510C       STA    BLONG+2
            1311 006D4   1748  2 7C00510A       STB    BLONG
            1312 006D6   1750  2 5C2A000A       LDX    5,10,M
            1313 006D8   1752  2 1680004C NAVO2 LDA    VV,5           PUT VV,VE,AND VN IN BUFFER
            1314 006DA   1754  2 3E80510E       STA    BVV,5
            1315 006DC   1756  2 6C2B0002       IMN    5,2,M
            1316 006DE   1758  2 643006D8       JGU    NAVO2
            1317 006E0   1760  2 5C2A000A       LDX    5,10,M
            1318 006E2   1762  2 16800014 NAVO3 LDA    VX,5
            1319 006E4   1764  2 3E80511A       STA    BVX,5          PUT VX,VY, AND VZ IN BUFFER
            1320 006E6   1766  2 6C2B0002       IMN    5,2,M
            1321 006E8   1768  2 643006E2       JGU    NAVO3
            1322 006EA   1770  2 74000078       RTA    NAVOR
            1323                                END
```

STATISTICS

TOTAL SHORTS	154
TOTAL LONGS	748
TOTAL INSTRUCTIONS	902
PERCENT SHORT	17.1
GENERATED NOPS	25
THEORETICAL PERCENT NOP LOADING	2.1
ACTUAL PERCENT NOP LOADING	1.7

```
                    *****ERROR MESSAGES*****

DECK NAME=*NAV   *

LINE NUMBER      DIAGNOSTIC
    378.....ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
1
```

XREF 1 DECK NAME=*NAV * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 1

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
0000C	12		5	A	116	117	749	814	887	1050	1074	1092	1100	1136			
0003C	60		6	AB	140	419											
000F2	242		4	AJ	111	434	888	1210	1215	1217	1250						
00010	16		7	ALT	159	576	577	610	611								
00150	336		7	AP	188	790	815	848	950	965	966	968	969	983	984	985	994
						995	1048	1049	1098	1099	1137	1151	1152	1169			
00036	54		5	ASCH	120	121											
0015C	348		7	AT	189	990	993	996	1047	1094	1097	1138	1150	1156			
0069E	1694		2	BITE	1272	1278											
05106	20742		13	BLAT	292	1306	1307										
0510A	20746		13	BLONG	293	1310	1311										
00030	48		4	BTE1	19												
00032	50		4	BTE3	20												
05102	20738		13	BTIME	291	1302	1303										
05100	20736			BUFORG	1	289											
0510E	20750		13	BVV	294	1314											
0511A	20762		13	BVX	295	1319											
00024	36		1	CCLG	308	701	702	760									
0069E	1694		2	CDPU	1273	1279											
0003C	60		9	CD01	223												
00040	64		9	CD02	224												
00044	68		9	CD03	225												
00038	56		5	CD040	122	415											
00048	72		9	CD04	226												
0004C	76		9	CD05	227												
00050	80		9	CD06	228												
00054	84		9	CD07	229												
00058	88		9	CD08	230												
0005C	92		9	CD09	231												
00060	96		9	CD10	232												
00064	100		9	CD11	233												
00068	104		9	CD12	234												
0006C	108		9	CD13	235												
00070	112		9	CD14	236												
00074	116		9	CD15	237												
00078	120		9	CD16	238	951	952										
0007C	124		9	CD17	239	959	960										
00080	128		9	CD18	240	955	956										
00084	132		9	CD19	241												
00088	136		9	CD20	242												
0008C	140		9	CD21	243												
00090	144		9	CD22	244												
00094	148		9	CD23	245												
00098	152		9	CD24	246												
0009C	156		9	CD25	247												
000A0	160		9	CD26	248												
000A4	164		9	CD27	249												
000A8	168		9	CD28	250	979	980										
000AC	172		9	CD29	251	973	974										
000B0	176		9	CD30	252	998	999										
000B4	180		9	CD31	253	1003	1004										
000B8	184		9	CD32	254	1039	1040										
000BC	188		9	CD33	255	1055	1056										

XREF 1 DECK NAME=*NAV * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 2

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES					
000C0	192	9	CD34	256					
000C4	196	9	CD35	257					
000C8	200	9	CD36	258					
000CC	204	9	CD37	259					
00000	208	9	CD38	260					
00004	212	9	CD39	261	1082	1083			
00008	216	9	CD40	262					
0000C	220	9	CD41	263					
000E0	224	9	CD42	264	1015	1016			
000E4	228	9	CD43	265	1009	1010			
000E8	232	9	CD44	266					
000EC	236	9	CD45	267					
000F0	240	9	CD46	268					
000F4	244	9	CD47	269					
000F8	248	9	CD48	270					
000FC	252	9	CD49	271					
00100	256	9	CD50	272					
00104	260	9	CD51	273					
00108	264	9	CD52	274	584				
0010C	268	9	CD53	275					
00110	272	9	CD54	276					
00114	276	9	CD55	277					
00118	280	9	CD56	278					
0011C	284	9	CD57	279					
00120	288	9	CD58	280					
00124	292	9	CD59	281					
00128	296	9	CD60	282					
0012C	300	9	CD61	283					
00130	304	9	CD62	284					
00134	308	9	CD63	285					
00138	312	9	CD64	287					
00038	56	6	CGCL	139	732	733	734		
0003C	12	7	CGDL	158	196	743	744	768	769
00012	18	6	CHAJ	129	1198	1203	1207		
00038	56	4	CIPM	23					
0000C	12	7	CL	196					
00000	0	9	CONCOM	197					
00052	82	4	CTR1	33					
00054	84	4	CTR2	34					
00056	86	4	CTR3	35					
00004	4	7	CWT	156	708	709	830	831	
0004A	74	4	CYLE	29					
0002E	46	7	C1	166					
00032	50	7	C2	167					
00030	48	6	C2GC	137	599	600	736	737	
00036	54	7	C3	168					
0003A	58	7	C4	169					
000E4	228	7	D	183	190	1212	1216	1225	1229
00066	102	4	DATA	41					
0000C	12	5	DCAR	117	1139	1155	1211	1224	
00010	16	6	DCON	128	900	901	904		
00002	2	9	DCSK	199	903				
00052	82	2	DC04	370	916	1021			

XREF 1 DECK NAME=*NAV * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 3

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES										
00056	86	2	0C42	371	1111	1112	1124	1125								
0005A	90	2	0C43	373	1118	1119										
*****UNDEFINED*****			DECATN		664	684										
05100	20736	13	DECFLG	290	1296	1297										
*****UNDEFINED*****			DECSQ		654	715	882									
0007A	122	1	DELR	339	442	443	613	614								
00030	48	9	DELT	220	621											
0001C	28	9	DFONE	214	603											
00078	120	7	DG	178												
00024	36	4	DPDV	16												
00028	40	4	DPHV	17												
00020	32	4	DPVV	15												
0004E	78	4	DRFV	31												
0001C	28	9	DTDC	215	907	963										
00074	116	1	DUMRET	334	1266	1269										
0069E	1694	2	DUMY	1266	1265	1270	1271	1272	1273	1274	1275	1276				
*****UNDEFINED*****			DVFD		444	721	731	908	913	917	922	1024	1113	1120	1126	
00038	56	1	DVI	313	949	989	1093									
0003E	62	4	DVX	26	436	626										
00014	20	4	DVXG	12	414	416	420	423	424	425	426	427	428			
00000	0	5	DVXI	113	421	435	896									
00042	66	4	DVY	27												
00018	24	4	DVYG	13												
00004	4	5	DVYJ	114												
00046	70	4	DVZ	28												
0001C	28	4	DVZG	14												
00008	8	5	DVZK	115												
00054	84	7	D1	177	192											
00034	52	9	D1032	221												
00038	56	9	D3032	222	1246											
00016	22	9	EIGHT	209												
0009C	156	7	E1	179												
000A8	168	7	E2	180												
00084	180	7	E3	181												
*****UNDEFINED*****			FENT		1254											
00030	48	5	FLGN	118	1218	1255	1257									
00046	70	2	FNINE	366	485											
0001E	30	9	FONE	213	452	827	935	940	1027							
00010	16	9	FOUR	206	594	877	970	1061	1153	1242						
00044	68	2	FSIX	365	469											
00048	72	2	FTEN	367	474											
00044	68	1	F1	314	938	939	997	1053								
00048	72	1	F2	315	943	944	1038	1078								
0069E	1694	2	GASC	1274	1280											
00024	36	2	GCA0	350	515	516										
00028	40	2	GCA1	352	507	508	551									
0002C	44	2	GCA2	354	497	544										
00030	48	2	GCA3	356	501	502										
00034	52	2	GCA4	358	548	549										
00038	56	2	GCA5	360	494	495	542									
0003C	60	2	GCA6	362	540	541										
00060	96	6	GM	141	988											
0002C	44	4	GMT	18												

XREF 1 DECK NAME=*NAV * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 4

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES									
00066	102		1	GS	323	883	884								
00000	0		1	GXDT	299	528	529	623	624						
00004	4		1	GYDT	300	533	534								
00008	8		1	GZDT	301	563	564								
00050	80		4	HDGV	32										
0005E	94		2	IA	378	376									
0006E	110		1	IAM	325	378	397	400	402	408					
00062	98		2	IA1	380										
0006C	108		2	IA1A	386	385									
00074	116		2	IA2	390	386									
00082	130		2	IA3	398	387									
00088	136		2	IA4	401	388									
0008C	140		2	IA5	403	389									
*****UNDEFINED*****				IB		379									
00098	152		2	IC	411	298	392	1232							
00070	112		1	ICM	326	327	328	329	331	332	333	335	336	411	429
0009A	154		2	IC1	412										
000AE	174		2	IC2	422										
000BE	190		2	ID	431	298	393	1233							
00070	112		1	IDM	327	431	437								
000C0	192		2	ID1	432										
000CC	204		2	IE	440	298	394								
00070	112		1	IEM	326	440	565								
000CE	206		2	IE1	441										
000EE	238		2	IE2	457										
001C8	456		2	IF	568	298	395								
00070	112		1	IFM	329	568	596								
001CC	460		2	IF1	570										
001F0	496		2	IF1A	589	595									
00200	512		2	IF2	598	298	569								
00072	114		1	IF2M	330	598	618								
00222	546		2	IF3	615										
0022A	554		2	IG	620	298	396								
00070	112		1	IGM	331	620	637								
0022C	556		2	IG1	621										
00230	560		2	IG1A	623	636									
0024E	590		2	IH	640	298	398								
00070	112		1	IHM	332	640	745								
00250	592		2	IH1	641										
002E6	742		2	IH10	718										
002FA	762		2	IH11	728										
002F2	754		2	IH12	724										
00306	774		2	IH13	734										
0030E	782		2	IH14	738										
0031A	794		2	IH15	744										
00286	646		2	IH2	668										
0028E	654		2	IH3	673										
00282	650		2	IH4	691										
0028A	698		2	IH5	696										
002C4	708		2	IH6	701										
002C8	712		2	IH7	703										
002D2	722		2	IH8	708										
002D6	726		2	IH9	710										

XREF 1 DECK NAME=*NAV * SRC 2000 CROSS REFERENCE DICTIONARY PAGE 5

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES				
00098	152		2	IIC	1232	1236				
0008E	190		2	IIE	1233	1236				
0040C	1036		2	IIF	1234	1236				
00632	1586		2	IIG	1235	1236				
0031E	798		2	IJ	748	298	399			
00070	112		1	IJM	333	748	890			
00320	800		2	IJ1	749					
0038C	908		2	IJ2	817					
003BC	956		2	IJ3	850					
003C0	960		2	IJ3A	852	863				
003D6	982		2	IJ4	864	862				
003DE	990		2	IJ4A	868	878				
003F4	1012		2	IJ5	879					
00400	1024		2	IJ6	885					
0069E	1694		2	IK	1270	298				
0040C	1036		2	IL	893	298	403	1234		
00070	112		1	ILM	335	893	1199			
0040E	1038		2	IL1	894					
004D4	1236		2	IL10	996					
00544	1348		2	IL11A	1055	1064	1070			
00556	1366		2	IL11B	1065	1063				
00578	1400		2	IL11C	1082	1089				
0053A	1338		2	IL11	1050					
0059A	1434		2	IL12	1100					
005E2	1506		2	IL13B	1148	1154				
00506	1494		2	IL13	1139					
0060E	1550		2	IL14	1182					
00630	1584		2	IL15	1199	902				
00418	1048		2	IL2	899					
0041E	1054		2	IL3	902					
00420	1056		2	IL4	903					
00424	1060		2	IL5	905					
0043A	1082		2	IL6	916					
00474	1140		2	IL7	945					
0047E	1150		2	IL8	950					
00496	1174		2	IL8A	965	971				
004C0	1216		2	IL9	986					
00632	1586		2	IM	1202	298	404	1235		
00070	112		1	IMM	336	1202	1231			
00634	1588		2	IM1	1203					
0063E	1598		2	IM2	1208					
00652	1618		2	IM3	1218					
00658	1624		2	IM4	1221					
0066C	1644		2	IM5	1231	1205	1220			
00058	88		1	IND	319	1052	1062	1066	1068	1072
00076	118		1	INM	337	1240	1260	1263		
00670	1648		2	IN1	1241					
00674	1652		2	IN1A	1243					
00676	1654		2	IN2	1244					
00682	1666		2	IN2A	1250	1253				
00698	1688		2	IN3	1261	1243				
0069C	1692		2	IN3A	1263					
00060	96		4	ITER	38					

XREF 1 DECK NAME=*NAV * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 6

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
000E4	228	7		J3X3	190												
0002C	44	9		KGDL	219	659											
0004A	74	2		KR1	368	601											
0004E	78	2		KR3	369	606											
0004E	78	7		KSN1	174												
00050	80	7		KSN2	175												
00052	82	7		KSN3	176												
00150	336	7		K3X3	191												
00008	8	6		LAT	126	666	667	738	739	1304	1305						
00024	36	6		LATB	134	665											
00024	36	7		LCA1	193												
00028	40	7		LCA4	194												
0002C	44	1		LDVX	310	592	593	630									
00030	48	1		LDVY	311												
00034	52	1		LDVZ	312												
00028	40	6		LGO	135	678											
0006E	110	4		LITE	45												
00020	32	6		LONB	133	685											
0000C	12	6		LONG	127	689	690	1308	1309								
00054	84	7		L3X3	192												
00000	0	7		MATCOM	154												
*****UNDEFINED*****				MATDAD		1213	1226										
0006C	108	4		MODE	44	1241	1261										
*****UNDEFINED*****				MULD31		417	432	812	845	945	986	1090	1134				
*****UNDEFINED*****				MULFD		448	458	461	465	471	476	481	487	498	509	511	517
						527	532	545	552	554	562	585	591	602	605	607	625
						631	644	650	660	677	713	725	735	761	772	778	787
						794	800	871	926	932	967	975	981	1000	1005	1011	1017
						1035	1041	1057	1084								
*****UNDEFINED*****				MUL33		885	1208	1221									
00064	100	4		NAVF	40	1262											
00078	120	1		NAVOR	338	1286	1294	1322									
00684	1716	2		NAVO1	1295	1293											
00608	1752	2		NAVO2	1313	1316											
006E2	1762	2		NAVO3	1318	1321											
006A4	1700	2		NAVO	1286	401	1284										
00004	4	9		NFOUR	200												
00000	0	5		NIACOM	112												
00000	0	6		NICOM	123												
00018	24	9		NINE	210												
0002C	44	7		NMO	165												
00008	8	9		NONE	202	406											
00036	54	5		NSCH	121	380	382	407	1259								
00006	6	9		NTWO	201	1258											
00000	0	9		N64	198												
000C0	192	7		OC	182												
00028	40	9		OMEG	218	676											
00024	36	9		OMGA	217	793											
0000A	10	9		ONE	203	381	899	1256	1295								
00020	32	9		ONHLF	216												
000AC	172	4		O14	76												
00094	148	4		O18	64												
000A4	164	4		O21	72												

XREF 1 DECK NAME=*NAV * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 7

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES
000A6	166	4	022		73	
000A2	162	4	023		71	
000A8	168	4	024		74	
000CA	202	4	025		91	
00096	150	4	030		65	
00098	152	4	031		66	
0009A	154	4	032		67	
0009C	156	4	033		68	
0009E	158	4	034		69	
000A0	160	4	035		70	
00086	134	4	04A		57	
00088	136	4	04B		58	
0008A	138	4	04C		59	
000B2	178	4	04D		79	
000B4	180	4	04E		80	
00072	114	4	04F		47	
00074	116	4	040		48	
00076	118	4	041		49	
00078	120	4	042		50	670
0007A	122	4	043		51	672
0007C	124	4	044		52	693
0007E	126	4	045		53	695
0008C	140	4	046		60	581
00080	128	4	047		54	858
00082	130	4	048		55	856
00084	132	4	049		56	
000D2	210	4	05A		95	
000C4	196	4	05B		88	
000C6	198	4	05D		89	
000C8	200	4	05E		90	
00086	182	4	050		81	
00088	184	4	051		82	
000BA	186	4	052		83	
000BC	188	4	053		84	
000BE	190	4	054		85	
000C0	192	4	055		86	
000C2	194	4	056		87	
000D6	214	4	057		97	
000D8	216	4	058		98	
000DA	218	4	059		99	
000EA	234	4	06A		107	
000EC	236	4	06B		108	
0008E	142	4	06C		61	
00090	144	4	06D		62	
00092	146	4	06E		63	
000CC	204	4	060		92	
00004	212	4	062		96	
000DC	220	4	063		100	
000DE	222	4	064		101	
000E0	224	4	065		102	
000E2	226	4	066		103	
000E4	228	4	067		104	
000E6	230	4	068		105	

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES												
000E8	232		4	U69	106												
00080	176		4	U71	78												
000AE	174		4	U72	77												
0000C	12		1	P	302	455	456	457									
00062	98		4	PHAS	39												
00068	104		4	PUSH	42												
00010	16		1	P3	303	462	463	514									
00014	20		1	P5	304	459	460	464	466	467	510	553					
00000	0		6	RAD	124	571	572	616	617								
00040	64		2	RADE	364	441	615										
0003A	58		4	RAT	24												
0003C	60		4	RATL	25												
00008	8		4	RATM	8	972	1008	1189	1190								
0000C	12		4	RATP	9	978	1014	1187	1188								
00014	20		7	RES1	160												
00018	24		7	RES2	161												
0001C	28		7	RES3	162												
00020	32		7	RES4	163												
00010	16		4	ROT1	10												
00012	18		4	ROT2	11												
0066E	1646		2	RTAL	1240	405	1238										
00004	4		6	RXYZ	125	573	716	717	720	730							
00034	52		4	R1CT	21												
00036	54		4	R2CT	22												
00000	0		2	R45M	341	947											
00108	264		7	SA	184	1223	1228	1230	1251								
00032	50		5	SAVT	119	1247	1248										
00028	40		1	SCLG	309	700	775	783									
000CC	204		6	SDVI	150	897	898	948	1191	1192	1193	1194	1195	1196			
000D0	208		6	SDVJ	151												
000D4	212		6	SDVK	152												
00014	20		9	SEVEN	208												
00034	52		6	SGCL	138	722	723	724									
00008	8		7	SGDL	157	195	742	753	754	759	786						
*****UNDEFINED*****				SINCOS		698	705	740									
00012	18		9	SIX	207												
00008	8		7	SL	195												
0069E	1694		2	SPIN	1271	1277											
00024	36		7	SRA	164	193	194										
00000	0		4	SRT1	6	905	906	909	910	920	921	1110	1183	1184			
00004	4		4	SRT2	7	911	912	914	915	1022	1023	1123	1185	1186			
00000	0		7	S#T	155	707	836	837	842								
003E	62		7	S1	170												
00042	66		7	S2	171												
002C	44		6	S2GC	136	468	479	480	503	604	726	727					
00046	70		7	S3	172												
0004A	74		7	S4	173												
00048	168		6	TEM	143	445	446	447	449	450	451	454	472	473	489	490	586
						587	588	608	609	612	645	646	651	652	653	714	801
						802	805	872	873	881	918	919	929	930	931	933	934
						942	976	977	982	1012	1013	1018	1019	1020	1033	1034	1036
						1037	1042	1079	1080	1081							
00084	180		6	TEM0	144	477	478	535	536	574	575	578	582	583	655	656	663

XREF 1 DECK NAME=*NAV * SRC 2000 CROSS REFERENCE DICTIONARY PAGE 9

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES												
						728	729	923	924	925	927	928	937	1025	1026	1029	1030
						1031	1032										
000B8	184		6	TEM1	145	482	483	484	488	491	537	538	539	543	546	547	560
						661	662	679	680	688	703	704					
000BC	188		6	TEM2	146	492	493	496	499	500	521	522	523	524	686	687	696
						697											
00018	24		1	TEM3	305	518	519	557	558								
0001C	28		1	TEM4	306	504	505	506	550	555	556	559					
00020	32		1	TEM5	307	512	513	520									
0001A	26		9	TEN	211	570	867	964	1051	1071	1147						
0006A	106		4	TEST	43												
0000E	14		9	THREE	205												
00058	88		4	TIME	36	673	674	1287	1288	1298	1299						
0069E	1694		2	TKTH	1275	1281											
00008	216		6	TLPO	153	1289	1300	1301									
0012C	300		7	TM	185	817	847										
00070	112		4	TMPR	46												
00150	336		7	TM1	186	188	189	191									
0069E	1694		2	TORK	1276	1282											
0000C	12		9	TWO	204	1197											
0005C	92		4	TO	37	675	1244	1245									
00050	80		1	VE	317												
*****UNDEFINED*****				VECADD		894	991	1045	1095								
*****UNDEFINED*****				VECSUB		412											
00174	372		7	VECT	187												
0006A	106		1	VEL2	324	865	866	874	875	876	879	880					
00054	84		1	VN	318												
0004C	76		4	VRTV	30												
0004C	76		1	VV	316	816	852	853	868	869	870	1313					
00014	20		6	VX	130	627	628	629	795	1318							
0005A	90		1	VXE	320	849											
00018	24		6	VY	131	803	804										
0005E	94		1	VYE	321												
0001C	28		6	VZ	132	808	809										
00062	98		1	VZE	322												
00084	132		6	V1	142	889											
00000	0		4	WLDCOM	5												
000C0	192		6	X	147	525	526	589	590	632	633	634	641	642	643	683	798
						799											
000C4	196		6	Y	148	530	531	647	648	649	681	682	791	792			
000C8	200		6	Z	149	561	657	658	710	711	712	718	719				
0001C	28		9	ZERO	212	214	215	422	453	470	475	486	750	757	758	781	782
						818	840	841	864	936	941	1028	1054	1076	1077	1101	1129
						1130	1140	1148	1149	1182	1206						

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                                  PAGE   1

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                           SOURCE
                                        $FAP SUBLIB                                            SUBLIB
            1              20                USE    20
            2                                EVEN
                                        *************************************************************************
                                        *                                                                       *
                                        *    GEANS MATH SUBROUTINE LIBRARY. ALL SUBROUTINES IN THIS LIBRARY    *
                                        *    RETURN A DOUBLE PRECISION RESULT EXCEPT MULS33, WHICH IS          *
                                        *    SINGLE PRECISION. THE ADDRESS OF TEMPORARY STORAGE MUST BE        *
                                        *    LOADED INTO XR6 BEFORE ANY CALLS.                                  *
                                        *                                                                       *
                                        *************************************************************************
                                        *
                                        *    CONSTANTS FOR SINCOS ROUTINE
                                        *
            3 00000      0 20 40E487EF A1SC     DEC    1.57079673
            4 00002      2 20 C02D5106 A3SC     DEC    -.64596486
            5 00004      4 20 3ED19AD6 A5SC     DEC    .079692215
            6 00006      6 20 BC8362F8 A7SC     DEC    -.0046761082
            7 00008      8 20 3A4FBE60 A9SC     DEC    .00015209895
            8 0000A     10 20 00800000 C1S23    SCALEB  1,8
            9 0000C     12 20 00000001 ONE      DEC    1
           10 0000E     14 20 00000002 TWO      DEC    2
           11 00010     16 20 00000003 THREE    DEC    3
           12 00012     18 20 00000000 DFONE  DEC     0                DOUBLE PRECISION 1.0
           13 00014     20 20 40C00000 FONE   DEC     1.0
           14 00012     18 20          ZERO   EQU     DFONE
           15 00016     22 20 C0000000 FMONE    DEC    -1.0
                                        *
                                        *   CONSTANTS FOR DECSQ ROUTINE
                                        *
           16 00018     24 20 007FFFFF MANTIS    HEX    007FFFFF
           17 0001A     26 20 FFFFFFFF NONE      HEX    FFFFFFFF
           18 0001C     28 20 20000000 BIT2      HEX    20000000
           19 0001E     30 20 00400000 BIT9      HEX    00400000
           20 00020     32 20 7F800000 EXPMQK    HEX    7F800000
           21 00022     34 20 7FFFFFFC XC        HEX    7FFFFFFC
           22 00024     36 20 7FFFFFFE XE        HEX    7FFFFFFE
           23 00026     38 20 4A95AA20 C1        SCALEB  0.5826924,0
           24 00028     40 20 356A55DF C2        SCALEB  0.41730760,0
           25 0002A     42 20 99FCEF32 SQRT2     HEX    99FCEF32        SQRT(2) TO 18 DIGITS
           26 0002C     44 20 40DA8279           HEX    40DA8279
                                        *
                                        *
                                        *
                                        *    CONSTANTS FOR DECATN ROUTINE
                                        *
           27 0002E     46 20 7FFFFFFC A1TN      HEX    7FFFFFFC        0.99999999984,M=0
           28 00030     48 20 AAAAB20C A3TN      HEX    AAAAB20C        -0.3333328936,M=-1
           29 00032     50 20 6661DBA9 A5TN      HEX    6661DBA9        0.1999653478,M=-2
           30 00034     52 20 B76E8FCC A7TN      HEX    B76E8FCC        -0.1417346061,M=-2
           31 00036     54 20 61329723 A9TN      HEX    61329723        0.0949195495,M=-3
           32 00038     56 20 807FFFFF FRACMS    HEX    807FFFFF        FRACTION MASK
           33 00016     22 20          BIT01     EQU    FMONE           BITS ZERO AND ONE ON,ALL OTHERS OFF
           34 0003A     58 20 4F800000 E31       HEX    4F800000        EXPONENT OF 31
           35 0003C     60 20 0F800000 C31S23    SCALEB  31,8
```

VERSION K20A0503 DECK NAME=*SUBL1B* PAGE 2

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
              36 0003E     62 20 15D88CFD IRT3T    HEX    15D88CFD      1.0/SQRT(3) = .577350269
              37 00040     64 20 4049E69D         HEX    4049E69D
              38 00042     66 20 5149153F PI      HEX    5149153F      3.141592654
              39 00044     68 20 416487ED         HEX    416487ED
              40 00046     70 20 5149153F PIO2    HEX    5149153F      PI/2 = 1.570796327
              41 00048     72 20 40E487ED         HEX    40E487ED
              42 0004A     74 20 430548E0 PIO6    HEX    430548E0      PI/6 = SCALEB  0.5235987757,0
              43 0004C     76 20 A1D7B43A RT3T    HEX    A1D7B43A      SQRT(3) = 1.732050808
              44 0004E     78 20 40EED9EB         HEX    40EED9EB
              45 00050     80 20 78A12F18 YLIMIT  HEX    78A12F18      0.267949192   2-SQRT(3)
              46 00052     82 20 3FC49851         HEX    3FC49851
                                                 *
                                                 *     CONSTANTS FOR EXP
                                                 *
              47 00054     84 20 94CC9179 LOG2E   HEX 94CC9179    DECD  1.442695041
              48 00056     86 20 40DC551D         HEX   40DC551D
              49 00058     88 20 FC0CA85F LN2D2   HEX   FC0CA85F    DECD  0.346573903
              50 0005A     90 20 3FD8B90B         HEX   3FD8B90B
              51 0005C     92 20 1A96481A A0D     HEX    1A96481A      DECD   12.015016753875
              52 0005E     94 20 42601EC1         HEX    42601EC1
              53 00060     96 20 8D839F86 A1D     HEX    8D839F86       DECD   601.8042666979565
              54 00062     98 20 454B39BC         HEX    454B39BC
              55 00064    100 20 7AC80C87 B1D     HEX    7AC80C87      DECD  60.090190731926
              56 00066    102 20 43782E2D         HEX    43782E2D
                                                 *
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                SOURCE
                                           *********************************************************************
                                           *                                                                   *
                                           *    SINCOS ROUTINE. COMPUTES SINE AND COSINE.                      *
                                           *    CALLING CONVENTION IS AS FOLLOWS.                              *
                                           *******  JS      SINCOS                                             *
                                           *******  JRU     *+4                                                *
                                           *******  PTR   SINE                                                 *
                                           *                                                                   *
                                           *    INPUT ARGUEMENT IS IN THE (A,B) REGISTERS.IT IS A DOUBLE       *
                                           *    PRECISION ANGLE IN PI RADIANS. THE SINE OUTPUT IS STORED       *
                                           *    IN THE LOCATION INDICATED BY THE POINTER IN THE CALL. THE      *
                                           *    COSINE IS RETURNED IN THE (A,B) REGISTERS.                     *
                                           *                                                                   *
                                           *********************************************************************
            58                                              EVEN
            59                                              ENTRY    SINCOS
            60                    20                        USE     20
            61                    24                        TEMP     24
            62 00000            0 24              SINSV     BSS     2
            63 00002            2 24              T0SC      BSS     2
            64 00004            4 24              T1SC      BSS     2
            65 00006            6 24              T2SC      BSS     2
            66 00008            8 24              T3SC      BSS     2
            67 0000A           10 24              T4SC      BSS     2
            68 0000C           12 24              T5SC      BSS     2
            69 0000E           14 24              T6SC      BSS     2
            70 00010           16 24              X1SV      BSS     2
            71 00012           18 24              X4SV      BSS     2
            72 00014           20 24              COMRTN    BSS     2
            73 00016           22 24              SCTURN    BSS     2
            74                    20                        USE     PREVIOUS
            75 00068          104 20 03000000     SINCOS    PTR     0,6
            76 0006A          106 20 6C330016               IMN     6,22,M
            77 00000            0 24                        UBASE   6,SINSV
            78 0006C          108 20 1F080010               STX     1,X1SV
            79 0006E          110 20 5C0A0000               LDX     1,A1SC,M
            80 00000            0 20                        BASE    1,A1SC
            81 00070          112 20 A085                   ADU     C1S23          CONVERT ANGLE TO PI RADIANS
            82 00071          113 20      3B03              STA     T2SC
            83 00072          114 20 7B02                   STB     T1SC
            84 00073          115 20      0400              CFX
            85 00074          116 20 3B01                   STA     T0SC
            86 00075          117 20      5089              LDB     ZERO
            87 00076          118 20 0480                   CXF
            88 00077          119 20      DB02              SFD     T1SC           SEPARATE FRACTION FROM INTEGER
            89 00078          120 20 3B03                   STA     T2SC
            90 00079          121 20      7B02              STB     T1SC
            91 0007A          122 20 1F200012               STX     4,X4SV
            92 0007C          124 20 5F200016               LDX     4,SCTURN
            93 0007E          126 20 36040002               LAE     2,4,I
            94 00080          128 20 06A0                   LXA     4
            95 00081          129 20      108B              LDA     FMONE
            96 00082          130 20 5089                   LDB     ZERO
            97 00083          131 20      DB02              SFD     T1SC
```

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VERSION K20A0503       DECK NAME=*SUBLIB*                                                              PAGE    4

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
             98 00084    132 20 3805              STA    T4SC
             99 00085    133 20       7804        STB    T3SC
            100 00086    134 20 1303              LDA    T2SC
GENERATED                            0700
            101 00088    136 20 640400C4          JS     B1IS2
            102 0008A    138 20 3807              STA    T6SC
            103 0008B    139 20       7806        STB    T5SC
            104 0008C    140 20 1305              LDA    T4SC
            105 0008D    141 20       3803        STA    T2SC
            106 0008E    142 20 640400C4          JS     B1IS2
            107 00090    144 20 3805              STA    T4SC
            108 00091    145 20       7804        STB    T3SC
                                            *
                                            *   DETERMINE QUADRANT OF ANGLE
                                            *
            109 00092    146 20 1301              LDA    T0SC
            110 00093    147 20       8088        AND    THREE
            111 00094    148 20 A0CC              ADD    SCDTB
            112 00095    149 20       3801        STA    T0SC
            113 00096    150 20 7301              RTA    T0SC
GENERATED                            0700
            114 00098    152 20 0000009A SCDTB    PTR    SCDTJ
            115 0009A    154 20 600B      SCDTJ   JRU    SCQ1
            116 0009B    155 20       6013        JRU    SCQ2
            117 0009C    156 20 601A              JRU    SCQ3
            118 0009D    157 20       1305 SCQ4   LDA    T4SC
            119 0009E    158 20 5304              LDB    T3SC
            120 0009F    159 20       3A01        STA    2,4
            121 000A0    160 20 7A00              STB    0,4
            122 000A1    161 20       1089        LDA    ZERO
            123 000A2    162 20 5089              LDB    ZERO
            124 000A3    163 20       DB06        SFD    T5SC
            125 000A4    164 20 6018              JRU    SCEX
            126 000A5    165 20       1089 SCQ1   LDA    ZERO
            127 000A6    166 20 5089              LDB    ZERO
            128 000A7    167 20       DB06        SFD    T5SC
            129 000A8    168 20 3A01              STA    2,4
            130 000A9    169 20       7A00        STB    0,4
            131 000AA    170 20 1089              LDA    ZERO
            132 000AB    171 20       5089        LDB    ZERO
            133 000AC    172 20 DB04              SFD    T3SC
            134 000AD    173 20       600F        JRU    SCEX
            135 000AE    174 20 1089      SCQ2    LDA    ZERO
            136 000AF    175 20       5089        LDB    ZERO
            137 000B0    176 20 DB04              SFD    T3SC
            138 000B1    177 20       3A01        STA    2,4
            139 000B2    178 20 7A00              STB    0,4
            140 000B3    179 20       1307        LDA    T6SC
            141 000B4    180 20 5306              LDB    T5SC
            142 000B5    181 20       6007        JRU    SCEX
            143 000B6    182 20 1307      SCQ3    LDA    T6SC
            144 000B7    183 20       5306        LDB    T5SC
            145 000B8    184 20 3A01              STA    2,4
            146 000B9    185 20       7A00        STB    0,4
            147 000BA    186 20 1305              LDA    T4SC
```

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VERSION K20A0503      DECK NAME=*SUBLIB*                                                      PAGE    5

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
             148 000BB    187 20      5304             LDB     T3SC
             149 000BC    188 20 5F200012 SCEX         LDX     4,X4SV
             150 000BE    190 20 5F080010              LDX     1,X1SV
             151 000C0    192 20 6C320016              IMP     6,22,M
             152 000C2    194 20 7300                  RTA     0,6
                                          *
                                          *     EXPANSION OF POLYNOMIAL
                                          *
GENERATED                             0700
             153 000C4    196 20 03000014 B1IS2        PTR     COMRTN
             154 000C6    198 20 9303                  MLF     T2SC
             155 000C7    199 20      3802             STA     T1SC
             156 000C8    200 20 9084                  MLF     A9SC
             157 000C9    201 20      B883             ADF     A7SC
             158 000CA    202 20 9302                  MLF     T1SC
             159 000CB    203 20      B882             ADF     A5SC
             160 000CC    204 20 9302                  MLF     T1SC
             161 000CD    205 20      B881             ADF     A3SC
             162 000CE    206 20 9302                  MLF     T1SC
             163 000CF    207 20      B880             ADF     A1SC
             164 000D0    208 20 9303                  MLF     T2SC
             165 000D1    209 20      730A             RTA     COMRTN
             166                                       DBASE   1
             167                                       DBASE   6
```

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VERSION K20A0503      DECK NAME=*SUBLIB*                                                                      PAGE    6

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                SOURCE
                                            *****************************************************************
                                            *    SQUARE ROOT ROUTINE.                                       *
                                            *    CALLING CONVENTION IS AS FOLLOWS.                          *
                                            *******  JS      DECSQ                                          *
                                            *                                                               *
                                            *    INPUT ARGUEMENT IS A DOUBLE PRECISION NUMBER IN THE (A,B)  *
                                            *    REGISTERS. OUTPUT IS THE SQUARE ROOT OF THE INPUT RETURNED *
                                            *    IN THE (A,B) REGISTERS.                                    *
                                            *                                                               *
                                            *****************************************************************
            169                                             ENTRY  DECSQ
            170                                             EVEN
            171                  20                         USE    20
            172                  24                         TEMP   24
            173 00018         24 24             DSQSV       BSS    2
            174 0001A         26 24             SQT1        BSS    2
            175 0001C         28 24             SQT2        BSS    2
            176 0001E         30 24             SQT4        BSS    2
            177 00020         32 24             M           BSS    2
            178 00022         34 24             Y0          BSS    2
            179 00024         36 24             TEMP        BSS    2
            180 00026         38 24             TEMP2       BSS    2
            181 00028         40 24             DSQRTN      BSS    2
            182                  20                         USE    PREVIOUS
            183 00002        210 20 03000000    DECSQ       PTR    0,6
            184 000D4        212 20 6C330010                IMN    6,16,M
            185 00018         24 24                         UBASE  6,DSQSV
            186 000D6        214 20 1F080002                STX    1,SQT1
            187 000D8        216 20 5C0A0000                LDX    1,A1SC,M
            188 00000          0 20                         BASE   1,A1SC
            189 000DA        218 20 1F100004                STX    2,SQT2
            190 000DC        220 20 1F200006                STX    4,SQT4
            191 000DE        222 20 633B                    JRL    IMARG          CHECK FOR NEGATIVE ARGUEMENT
            192 000DF        223 20      6102               JRN    DECS1
            193 000E0        224 20 6030                    JRU    OUT            CHECK FOR ZERO
            194 000E1        225 20      3806   DECS1       STA    TEMP           SAVE UPPER HALF OF ARG.
            195 000E2        226 20 808C                    AND    MANTIS         MASK OFF FRACTION
            196 000E3        227 20      0808               SLLD   8              LEFT JUSTIFY
            197 000E4        228 20 3B04                    STA    M              STORE FRACTION IN M
            198 000E5        229 20      A086               ADU    ONE            CLEAR CARRY BIT
            199 000E6        230 20 1304                    LDA    M
            200 000E7        231 20      E091               SBU    XC             CHECK MAGNITUDE OF FRACTION
            201 000E8        232 20 6304                    JRL    DECS3
            202 000E9        233 20      0861               SRLD   1
            203 000EA        234 20 A092                    ADU    XE
            204 000EB        235 20      6011               JRU    DECS4
            205 000EC        236 20 1304        DECS3       LDA    M
            206 000ED        237 20      D093               MUL    C1             0.5826924*M
            207 000EE        238 20 A094                    ADU    C2             0.41730760+0.5826924*M
            208 000EF        239 20      3805               STA    Y0             INITIAL APPROX FOR SQRT(M),Y0
            209 000F0        240 20 5C120002                LDX    2,2,M          SETS UP COUNTER FOR ITERATION
            210 000F2        242 20 1304        DECS2       LDA    M
            211 000F3        243 20      F305               DVD    Y0             M/Y0
            212 000F4        244 20 A305                    ADU    Y0             Y0+M/Y0
```

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VERSION K20A0503     DECK NAME=*SUBLIB*                                                      PAGE   7

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            213 000F5    245 20       0861           SRLD   1         (Y0+M/Y0)/2
            214 000F6    246 20 3B05                 STA    Y0
GENERATED                             0700
            215 000F8    248 20 6C130001             IMN    2,1,M        DECREMENT COUNTER
            216 000FA    250 20 643000F2             JGU    DECS2
            217 000FC    252 20 0868        DECS4    SRLD   8            SHIFT FRACTION RIGHT
            218 000FD    253 20       3807           STA    TEMP2        STORE SIGNIFICANT PART OF NUMBER
            219 000FE    254 20 5C10001A             LDX    2,NONE       LOAD XR2 WITH FLAG
            220 00100    256 20 1306                 LDA    TEMP
            221 00101    257 20       8090           AND    EXPMQK       ISOLATE EXPONENT
            222 00102    258 20 0C61                 SRC    1            DIVIDE BY 2
            223 00103    259 20       A08E           ADU    BIT2         ADD EXPONENT SIGN BIT
            224 00104    260 20 8C00001E             SAM    BIT9,L       CHECK FOR ODD EXPONENT
            225 00106    262 20 6C120001             IMP    2,1,M
            226 00108    264 20 C307                 LOR    TEMP2        ADD FRACTION
GENERATED                             0700
            227 0010A    266 20 5C22002A             LDX    4,SQRT2,M
            228 0010C    268 20 6C130001             IMN    2,1,M
            229 0010E    270 20 640401CC             JS     MULFD        IF EXPONENT ODD MULTIPLY BY SQRT(2)
            230 00110    272 20 5F100004 OUT         LDX    2,SQT2
            231 00112    274 20 5F200006             LDX    4,SQT4
            232 00114    276 20 5F080002             LDX    1,SQT1
            233 00116    278 20 6C320010             IMP    6,16,M
            234 00118    280 20 7300                 RTA    0,6
            235 00119    281 20       1089 IMARG     LDA    ZERO
            236 0011A    282 20 5089                 LDB    ZERO         RETURN ZERO FOR NEGATIVE ARG.
            237 0011B    283 20       608B           JRU    OUT
            238                                      DBASE  1
            239                                      DBASE  6
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                    SOURCE
                                 ********************************************************************
                                 *                                                                  *
                                 *    ARC TANGENT ROUTINE. TAKES AS INPUT TWO INPUTS, ARCTAN(Y/X).  *
                                 *    CALLING CONVENTION IS AS FOLLOWS.                             *
                                 *******  LDX     4,X,M                                            *
                                 *******  JS      DECATN                                           *
                                 *                                                                  *
                                 *    THE DIVIDEND IS PASSED IN THE (A,B) REGISTERS. THE ADDRESS OF *
                                 *    THE DIVISOR IS IN XR4. THE OUTPUT IS IN PI RADIANS AND IS     *
                                 *    RETURNED IN THE (A,B) REGISTERS.                              *
                                 *                                                                  *
                                 ********************************************************************
  241                                    ENTRY   DECATN
  242                                    EVEN
                                 *
                                 *    ARC TANGENT ROUTINE
                                 *
  243                 20                 USE     20
  244                 24                 TEMP    24
  245 0002A        42 24          ATNSV   BSS     2
  246 0002C        44 24          DETN1   BSS     2
  247 0002E        46 24          DETN4   BSS     2
  248 00030        48 24          QLOC    BSS     2
  249 00032        50 24          TEM1    BSS     4
  250 00036        54 24          ARG     BSS     4
  251 0003A        58 24          ZTN     BSS     4
  252 0003E        62 24          ZT2N    BSS     2
  253 00040        64 24          C       BSS     2
  254 00042        66 24          ATNYT   BSS     4
  255 00046        70 24          YTURN   BSS     2
  256 00048        72 24          ATNRTN  BSS     2
  257                 20                 USE     PREVIOUS
  258 0011C    284 20 03000000 DECATN  PTR     0,6
  259 0011E    286 20 6C33001E         IMN     6,30,M
  260 0002A     42 24                  UBASE   6,ATNSV
  261 00120    288 20 1F080002         STX     1,DETN1
  262 00122    290 20 5C0A0000         LDX     1,A1SC,M
  263 00000      0 20                  BASE    1,A1SC
  264 00124    292 20 1F200004         STX     4,DETN4
  265 00126    294 20 3804             STA     TEM1
  266 00127    295 20     620B         JRG     QUAD12          IS ARG IN QUAD 1 OR 2
  267 00128    296 20 1201             LDA     2,4
  268 00129    297 20     6205         JRG     QUAD4
  269 0012A    298 20 340001A1         LAE     QD3
  270 0012C    300 20 3803             STA     QLOC
  271 0012D    301 20     600E         JRU     START
  272 0012E    302 20 340001A3 QUAD4   LAE     QD4
  273 00130    304 20 3803             STA     QLOC
  274 00131    305 20     600A         JRU     START
  275 00132    306 20 1201     QUAD12  LDA     2,4
  276 00133    307 20     6205         JRG     QUAD1
  277 00134    308 20 3400019D         LAE     QD2
  278 00136    310 20 3803             STA     QLOC
  279 00137    311 20     6004         JRU     START
```

VERSION K20A0503 DECK NAME=*SUBLIB*

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            280 0013B    312 20 340001A6 QUAD1    LAE     QD1
            281 0013A    314 20 3803             STA     QLOC
            282 0013B    315 20      1304 START  LDA     TEM1
            283 0013C    316 20 640401F6         JS      DVFD        Y/X
                                 *
                                 *    CHECK FOR THE FOLLOWING CONDITIONS
                                 *    0/1.0,1.0/0,0/-1.0,-1.0/0
                                 *
            284 0013E    318 20 610D             JRN     ATN1        IS Y .GT. 0
            285 0013F    319 20      1201        LDA     2,4         NO
            286 00140    320 20 6106             JRN     ATN0        IS X .GT. 0
            287 00141    321 20      10A4        LDA     PIO2+2
            288 00142    322 20 50A3             LDB     PIO2
            289 00143    323 20      380D        STA     ATNYT+2
            290 00144    324 20 780C             STB     ATNYT
            291 00145    325 20      7303        RTA     QLOC
            292 00146    326 20 1089     ATN0    LDA     ZERO        X IS .GT.0
            293 00147    327 20      5089        LDB     ZERO
            294 00148    328 20 380D             STA     ATNYT+2
            295 00149    329 20      780C        STB     ATNYT
            296 0014A    330 20 7303             RTA     QLOC
            297 0014B    331 20      6206 ATN1   JRG     ATN2
            298 0014C    332 20 3805             STA     TEM1+2
            299 0014D    333 20      7804        STB     TEM1
            300 0014E    334 20 1089             LDA     ZERO
            301 0014F    335 20      5089        LDB     ZERO
            302 00150    336 20 D804             SFD     TEM1        ARG=ABS(ARG)
            303 00151    337 20      3807 ATN2   STA     ARG+2
            304 00152    338 20 7806             STB     ARG
            305 00153    339 20      D889        SFD     DFONE
            306 00154    340 20 6204             JRG     ATN3        IS ARG .GT. 1.0
            307 00155    341 20      1307        LDA     ARG+2
            308 00156    342 20 5306             LDB     ARG
            309 00157    343 20      6007        JRU     ATN31
            310 00158    344 20 108A     ATN3    LDA     FONE
            311 00159    345 20      5089        LDB     ZERO
            312 0015A    346 20 5F22000C         LDX     4,ARG,M
            313 0015C    348 20 640401F6         JS      DVFD        1.0/ARG
            314 0015E    350 20 3809     ATN31   STA     ZTN+2
            315 0015F    351 20      7808        STB     ZTN         Z=ARG OR 1.0/ARG
            316 00160    352 20 D8A8             SFD     YLIMIT      YLIMIT=2.0-SQRT(3)
            317 00161    353 20      6208        JRG     ATN4
            318 00162    354 20 1309             LDA     ZTN+2
            319 00163    355 20      5308        LDB     ZTN
            320 00164    356 20 64040188         JS      YCOMP
            321 00166    358 20 1089             LDA     ZERO
            322 00167    359 20      3808        STA     C           C=0
            323 00168    360 20 6018             JRU     ATN5
            324 00169    361 20      1309 ATN4   LDA     ZTN+2
            325 0016A    362 20 5308             LDB     ZTN
            326 0016B    363 20      98A6        AFD     RT3T        Y+SQRT(3)
            327 0016C    364 20 3805             STA     TEM1+2
            328 0016D    365 20      7804        STB     TEM1
            329 0016E    366 20 1309             LDA     ZTN+2
            330 0016F    367 20      5308        LDB     ZTN
```

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VERSION K20A0503      DECK NAME=*SUBLIB*                                                          PAGE  10

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
            331 00170    368 20 D89F               SFD   IRT3T        Y-1.0/SQRT(3)
GENERATED                         0700
            332 00172    370 20 5C22004C           LDX   4,RT3T,M
            333 00174    372 20 640401CC           JS    MULFD        (Y-(1.0/SQRT(3)))*SQRT(3)
            334 00176    374 20 5F220008           LDX   4,TEM1,M
            335 00178    376 20 640401F6           JS    DVFD         (Y-1.0/SQRT(3))*SQRT(3)/(Y+SQRT(3))
            336 0017A    378 20 3809               STA   ZTN+2
            337 0017B    379 20      7808          STB   ZTN
            338 0017C    380 20 640401B8           JS    YCOMP
            339 0017E    382 20 10A5               LDA   PI06
            340 0017F    383 20      3808          STA   C            C=PI/6
            341 00180    384 20 1098      ATN5     LDA   A9TN
            342 00181    385 20      D30A          MUL   ZT2N         A9*Z2
            343 00182    386 20 0E41               SRA   1,4
            344 00183    387 20      A09A          ADU   A7TN         A9*Z2+A7
            345 00184    388 20 D30A               MUL   ZT2N         (A9*Z2+A7)*Z2
            346 00185    389 20      0E40          SRA   0,4
            347 00186    390 20 A099               ADU   A5TN         (A9*Z2+A7)*Z2+A5
            348 00187    391 20      D30A          MUL   ZT2N         (A9*Z2+A7)*Z2+A5)*Z2
            349 00188    392 20 0E41               SRA   1,4
            350 00189    393 20      A098          ADU   A3TN         (A9*Z2+A7)*Z2+A5)*Z2+A3)
            351 0018A    394 20 D30A               MUL   ZT2N         (A9*Z2+A7)*Z2+A5)*Z2+A3)*Z2
            352 0018B    395 20      0E41          SRA   1,4
            353 0018C    396 20 A097               ADU   A1TN         (A9*Z2+A7)*Z2+A5)*Z2+A3)*Z2+A1
            354 0018D    397 20      D308          MUL   ZTN          (A9*Z2+A7)*Z2+A5)*Z2+A3)*Z2+A1)*Z
            355 0018E    398 20 5F200008           LDX   4,TEM1
            356 00190    400 20 0E40               SRA   0,4
            357 00191    401 20      A30B          ADU   C            (A9*Z2+A7)*Z2+A5)*Z2+A3)*Z2+A1)*Z+C
            358 00192    402 20 0480               CXF
            359 00193    403 20      E09E          SBU   C31S23       CORRECT FOR IMPLICIT MULTIPLY BY 2**31
            360 00194    404 20 380D               STA   ATNYT+2
            361 00195    405 20      780C          STB   ATNYT
            362 00196    406 20 1307               LDA   ARG+2
            363 00197    407 20      5306          LDB   ARG
            364 00198    408 20 D889               SFD   DFONE
            365 00199    409 20      6218          JRG   ATN6
            366 0019A    410 20 130D               LDA   ATNYT+2
            367 0019B    411 20      530C          LDB   ATNYT
            368 0019C    412 20 7303               RTA   QLOC
            369 0019D    413 20      10A2 QD2      LDA   PI+2
            370 0019E    414 20 50A1               LDB   PI
            371 0019F    415 20      D80C          SFD   ATNYT
            372 001A0    416 20 6006               JRU   QD1
            373 001A1    417 20      98A1 QD3      AFD   PI
            374 001A2    418 20 6004               JRU   QD1
            375 001A3    419 20      1089 QD4      LDA   ZERO
            376 001A4    420 20 5089               LDB   ZERO
            377 001A5    421 20      D80C          SFD   ATNYT
            378 001A6    422 20 5C220042 QD1       LDX   4,PI,M
            379 001A8    424 20 640401F6           JS    DVFD         ATNYT/PI,ANSWER RETURNED IN PI RADIANS
            380 001AA    426 20 5F200004           LDX   4,DETN4
            381 001AC    428 20 5F080002           LDX   1,DETN1
            382 001AE    430 20 6C32001E           IMP   6,30,M
            383 001B0    432 20 7300               RTA   0,6
```

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VERSION K20A0503      DECK NAME=*SUBLIB*                                                                   PAGE  11

DIAGNOSTICS LINE ADRES DADRES LC   PROGRAM                                           SOURCE
            384 001B1     433 20       10A4 ATN6       LDA     PI02+2
            385 001B2     434 20 50A3                  LDB     PI02
            386 001B3     435 20       DB0C            SFD     ATNYT            ATNYT=PI/2-ATNYT
            387 001B4     436 20 3B0D                  STA     ATNYT+2
            388 001B5     437 20       7B0C            STB     ATNYT
            389 001B6     438 20 7303                  RTA     QLOC
                                            *
                                            *
                                            *
GENERATED                              0700
            390 001B8     440 20 0300001C YCOMP        PTR     YTURN
            391 001BA     442 20 8090                  AND     EXPMQK           ISOLATE EXPONENT
            392 001BB     443 20       C08B            LOR     BIT01            ADD SIGN
            393 001BC     444 20 0C56                  SRA     22               SHIFT AND MULTIPLY BY 2
            394 001BD     445 20       3B04            STA     TEM1
            395 001BE     446 20 1089                  LDA     ZERO
            396 001BF     447 20       E304            SBU     TEM1
            397 001C0     448 20 06A0                  LXA     4
            398 001C1     449 20       0C41            SRA     1                DIVIDE BY 2
            399 001C2     450 20 3B04                  STA     TEM1             SAVE EXPONENT OF Z
            400 001C3     451 20       1309            LDA     ZTN+2
            401 001C4     452 20 809C                  AND     FRACMS           ISOLATE FRACTION
            402 001C5     453 20       C09D            LOR     E31              CORRECT FOR IMPLICIT MULTIPLY BY 2**31
            403 001C6     454 20 0400                  CFX
            404 001C7     455 20       3B08            STA     ZTN
            405 001C8     456 20 D308                  MUL     ZTN              Z**2
            406 001C9     457 20       3B0A            STA     ZT2N
            407 001CA     458 20 730E                  RTA     YTURN
            408                                        DBASE   1
            409                                        DBASE   6
```

```
VERSION K20A0503     DECK NAME=*SUBLIB*                                                                        PAGE  12

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                              *********************************************************************
                                              *                                                                   *
                                              *    SUBROUTINE MULFD. HYBRID DOUBLE PRECISION MULTIPLY ROUTINE     *
                                              *    CALLING CONVENTION IS AS FOLLOWS.                              *
                                              *******  LDX     4,ARG,M                                            *
                                              *******  JS      MULFD                                              *
                                              *                                                                   *
                                              *    THE MULTIPLICAND IS PASSED IN THE (A,B) REGISTERS. ADDRESS OF  *
                                              *    THE MULTIPLIER IS IN XR4. OUTPUT IS RETURNED IN THE (A,B)      *
                                              *    REGISTERS.                                                     *
                                              *                                                                   *
                                              *********************************************************************
GENERATED                            0700
             411                                      EVEN
             412                                      ENTRY  MULFD
             413              20                      USE    20
             414              24                      TEMP    24
             415 0004A     74 24           TAB        BSS    4
             416 0004E     78 24           TXB        BSS    2
             417 00050     80 24           TXA        BSS    2
             418 00052     82 24           TYB        BSS    2
             419 00054     84 24           TYA        BSS    2
             420 00056     86 24           RETM       BSS    2
             421              20                      USE    PREVIOUS
             422 001CC    460 20 03000000 MULFD      PTR    0,6
             423 001CE    462 20 6C33000C            IMN    6,12,M
             424 0004A     74 24                      UBASE  6,TAB
             425 001D0    464 20 6102                 JRN    XNZ               CHECK FOR MULTIPLIER=0
             426 001D1    465 20     6021             JRU    PRODZ
             427 001D2    466 20 3B03      XNZ        STA    TXA
GENERATED                            0700
             428 001D4    468 20 14020000             LDA    0,M
             429 001D6    470 20 3B02                 STA    TXB
             430 001D7    471 20     3B04             STA    TYB
             431 001D8    472 20 1303                 LDA    TXA
             432 001D9    473 20     DB02             SFD    TXB
             433 001DA    474 20 3B02                 STA    TXB
             434 001DB    475 20     1201             LDA    2,4
             435 001DC    476 20 6102                 JRN    YNZ
             436 001DD    477 20     6015             JRU    PRODZ
             437 001DE    478 20 5200      YNZ        LDB    0,4
             438 001DF    479 20     3B05             STA    TYA
             439 001E0    480 20 DB04                 SFD    TYB
             440 001E1    481 20     3B04             STA    TYB
             441 001E2    482 20 9303                 MLF    TXA
             442 001E3    483 20     3B01             STA    TAB+2
             443 001E4    484 20 7B00                 STB    TAB
             444 001E5    485 20     1305             LDA    TYA
             445 001E6    486 20 9302                 MLF    TXB
             446 001E7    487 20     9B00             AFD    TAB
             447 001E8    488 20 3B01                 STA    TAB+2
             448 001E9    489 20     7B00             STB    TAB
             449 001EA    490 20 1305                 LDA    TYA
             450 001EB    491 20     9303             MLF    TXA
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                    SOURCE
            451 001EC    492 20 9800     NUFLO    AFD    TAB
GENERATED                       0700
            452 001EE    494 20 6C32000C MULOUT   IMP    6,12,M
            453 001F0    496 20 7300             RTA    0,6
GENERATED                       0700
            454 001F2    498 20 54020000 PRODZ    LDB    0,M
            455 001F4    500 20 6086             JRU    MULOUT
            456                                  DBASE  6
```

```
VERSION K2040503      DECK NAME=*SUBLIB*                                                                        PAGE  14

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                            *****************************************************************************
                                            *                                                                           *
                                            *    DVFD ROUTINE. HYBRID DOUBLE PRECISION DIVIDE ROUTINE.                  *
                                            *    CALLING CONVENTION IS AS FOLLOWS.                                      *
                                            ******   LDX     4,DVSR,M                                                   *
                                            ******** JS      DVFD                                                       *
                                            *                                                                           *
                                            *    THE DIVIDEND IS PASSED IN THE (A,B) REGISTERS. THE ADDRESS OF          *
                                            *    THE DIVISOR IS IN XR4. OUTPUT IS RETURNED IN THE (A,B)                 *
                                            *    REGISTERS.                                                             *
                                            *                                                                           *
                                            *****************************************************************************
GENERATED                              0700
         458                                             EVEN
         459                                             ENTRY   DVFD
         460                20                           USE     20
         461                24                           TEMP    24
         462 00058       88 24                 TAC       BSS     4
         463 0005C       92 24                 TA        BSS     4
         464 00060       96 24                 TB        BSS     4
         465 00064      100 24                 TP        BSS     4
         466 00068      104 24                 TQ        BSS     4
         467 0006C      108 24                 RETD      BSS     2
         468                20                           USE     PREVIOUS
         469 001F6      502 20 03000000 DVFD             PTR     0,5
         470 001F8      504 20 6C330014                  IMN     6,20,M
         471 00058       88 24                           UBASE   6,TAC
         472 001FA      506 20 6102                      JRN     NZ1
         473 001FB      507 20      6023                 JRU     ZQ00
         474 001FC      508 20 3801         NZ1          STA     TAC+2
         475 001FD      509 20      7800                 STB     TAC
         476 001FE      510 20 14020000                  LDA     0,M
         477 00200      512 20 3802                      STA     TA
         478 00201      513 20      3808                 STA     TQ
         479 00202      514 20 1201                      LDA     2,4
         480 00203      515 20      6102                 JRN     NZ2
         481 00204      516 20 601A                      JRU     ZQ00
         482 00205      517 20      3803 NZ2             STA     TA+2
         483 00206      518 20 5200                      LDB     0,4
         484 00207      519 20      D802                 SFD     TA
         485 00208      520 20 3804                      STA     TB
         486 00209      521 20      1301                 LDA     TAC+2
         487 0020A      522 20 5300                      LDB     TAC
         488 0020B      523 20      B303                 DVF     TA+2
         489 0020C      524 20 3809                      STA     TQ+2
         490 0020D      525 20      9304                 MLF     TB
         491 0020E      526 20 3807                      STA     TP+2
         492 0020F      527 20      7806                 STB     TP
         493 00210      528 20 1309                      LDA     TQ+2
         494 00211      529 20      9303                 MLF     TA+2
         495 00212      530 20 9806                      AFD     TP
         496 00213      531 20      3807                 STA     TP+2
         497 00214      532 20 7806                      STB     TP
         498 00215      533 20      1301                 LDA     TAC+2
```

VERSION K20A0503 DECK NAME=*SUBLIB* PAGE 15

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                    SOURCE
              499 00216    534 20 5300                LDB    TAC
              500 00217    535 20     0B06            SFD    TP
              501 00218    536 20 B303                DVF    TA+2
              502 00219    537 20     9B08            AFD    TQ
              503 0021A    538 20 6C320014 DVDOUT     IMP    6,20,M
              504 0021C    540 20 7300                RTA    0,6
GENERATED                          0700
              505 0021E    542 20 540200000 ZQUO      LDB    0,M
              506 00220    544 20 6086                JRU    DVDOUT
              507                                     DBASE  6
```

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VERSION K20A0503      DECK NAME=*SUBLIB*                                                                PAGE  16

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
                                                   ******************************************************************
                                                   *                                                                *
                                                   *    EXPONENTIAL SUBROUTINE.                                     *
                                                   *    CALLING CONVENTION IS AS FOLLOWS.                           *
                                                   *******  JS      EXP                                             *
                                                   *                                                                *
                                                   *    INPUT ARGUEMENT IS A DOUBLE PRECISION NUMBER IN THE (A,B)   *
                                                   *    REGISTERS. OUTPUT IS RETURNED IN THE (A,B) REGISTERS.       *
                                                   *                                                                *
                                                   ******************************************************************
            509                                            ENTRY      EXP
GENERATED                               0700
            510                                            EVEN
            511                 20                         USE      20
            512                 24                         TEMP      24
            513 0006E       110 24                 EXPSV   BSS      2
            514 00070       112 24                 XTD1    BSS    4
            515 00074       116 24                 XTD2    BSS    4
            516 00078       120 24                 N       BSS    2
            517 0007A       122 24                 YD      BSS    2
            518 0007C       124 24                 Y       BSS    2
            519 0007E       126 24                 Z       BSS    4
            520 00082       130 24                 EXR1      BSS    2
            521 00084       132 24                 EXR4      BSS    2
            522 00086       134 24                 EXPRTN BSS    2
            523                 20                         USE      PREVIOUS
            524 00222       546 20 03000000 EXP            PTR      0,6
            525 00224       548 20 6C330018                  IMN     6,24,M
            526 0006E       110 24                           UBASE  6,EXPSV
            527 00226       550 20 1F200016                  STX     4,EXR4
            528 00228       552 20 1F080014                  STX     1,EXR1
            529 0022A       554 20 5C0A0000                  LDX     1,A1SC,M
            530 00000         0 20                           BASE   1,A1SC
            531 0022C       556 20 5C220054                LDX    4,LOG2E,M
            532 0022E       558 20 640401CC                JS     MULFD
            533 00230       560 20 7801                    STB    XTD1
            534 00231       561 20     3802                STA    XTD1+2
            535 00232       562 20 0400                    CFX
            536 00233       563 20     5089                LDB     ZERO
            537 00234       564 20 0857                    SLL    23
            538 00235       565 20     3805                STA     N
            539 00236       566 20 0C57                    SRA    23
            540 00237       567 20     0480                CXF
            541 00238       568 20 7803                    STB    XTD2
            542 00239       569 20     3804                STA    XTD2+2
            543 0023A       570 20 5301                    LDB    XTD1
            544 0023B       571 20     1302                LDA    XTD1+2
            545 0023C       572 20 0803                    SFD    XTD2
GENERATED                               0700
            546 0023E       574 20 5C220058                LDX 4,LN2D2,M
            547 00240       576 20 640401CC                JS     MULFD
            548 00242       578 20 7806                    STB     YD
            549 00243       579 20     3807                STA     Y
            550 00244       580 20 5F22000C                LDX    4,YD,M
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            551 00246    582 20 640401CC        JS    MULFD
            552 00248    584 20 9882            AFD    B1D
            553 00249    585 20     3802        STA   XTD1+2
            554 0024A    586 20 7801            STB   XTD1
            555 0024B    587 20     50B0        LDB    A1D
            556 0024C    588 20 10B1            LDA    A1D+2
GENERATED                           0700
            557 0024E    590 20 5F220002        LDX   4,XTD1,M
            558 00250    592 20 640401F6        JS    DVFD
            559 00252    594 20 9806            AFD    YD
            560 00253    595 20     D8AE        SFD    A0D
            561 00254    596 20 3802            STA   XTD1+2
            562 00255    597 20     7801        STB   XTD1
            563 00256    598 20 1307            LDA    Y
            564 00257    599 20     5306        LDB    YD
            565 00258    600 20 6102            JN    EXP1
            566 00259    601 20     6003        JU    EXP2
            567 0025A    602 20 A085     EXP1   ADU   C1S23
GENERATED                           0700
            568 0025C    604 20 5F220002 EXP2   LDX   4,XTD1,M
            569 0025E    606 20 640401F6        JS    DVFD
            570 00260    608 20 D889            SFD     DFONE
            571 00261    609 20     3B09        STA   Z+2
            572 00262    610 20 7B08            STB    Z
GENERATED                           0700
            573 00264    612 20 5F220010        LDX   4,Z,M
            574 00266    614 20 640401CC        JS    MULFD
            575 00268    616 20 A305            ADU    N
GENERATED                           0700
            576 0026A    618 20 5F200016          LDX    4,EXR4
            577 0026C    620 20 5F080014          LDX    1,EXR1
            578 0026E    622 20 6C320018          IMP    6,24,M
            579 00270    624 20 7300            RTA    0,6
            580                                   DBASE  1
            581                                   DBASE  6
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                                  PAGE  18

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
                                           *
                                           *
                                           *********VECTOR ADD ROUTINE
                                           *********CALLING SEQUENCE
                                           **********JS      VECADD
                                           **********JRU    *+8
                                           **********PTR      V1
                                           **********PTR      V2
                                           **********PTR      V3
                                           *
GENERATED                           0700
            583                                     EVEN
            584                                     ENTRY   VECADD
            585                20                   USE     20
            586                24                   TEMP    24
            587 00088     136 24           VECA3    BSS     2
            588 0008A     138 24           VECA4    BSS     2
            589 0008C     140 24           VECA5    BSS     2
            590 0008E     142 24           VECATN   BSS     2
            591                20                   USE     PREVIOUS
            592 00272     626 20 03000000 VECADD    PTR     0,6
            593 00274     628 20 6C330006           IMN     6,6,M
            594 00088     136 24                      UBASE  6,VECA3
            595 00276     630 20 1F180000           STX     3,VECA3
            596 00278     632 20 1F200002           STX     4,VECA4
            597 0027A     634 20 1F280004           STX     5,VECA5
            598 0027C     636 20 5F280006           LDX     5,VECATN
            599 0027E     638 20 36840006           LAE     6,5,I          POINTER TO RESULTANT VECTOR V3
            600 00280     640 20 06A0               LXA     4
GENERATED                           0700
            601 00282     642 20 36840004           LAE     4,5,I          POINTER TO VECTOR V2
            602 00284     644 20 0698               LXA     3
GENERATED                           0700
            603 00286     646 20 36840002           LAE     2,5,I          POINTER TO VECTOR V1
            604 00288     648 20 06A8               LXA     5
            605 00289     649 20     1281           LDA     2,5
            606 0028A     650 20 5280               LDB     0,5
            607 0028B     651 20     9980           AFD     0,3
            608 0028C     652 20 3A01               STA     2,4
            609 0028D     653 20     7A00           STB     0,4
            610 0028E     654 20 1283               LDA     6,5           NEXT ELEMENT
            611 0028F     655 20     5282           LDB     4,5
            612 00290     656 20 9982               AFD     4,3
            613 00291     657 20     3A03            STA    6,4            STORE RESULTS
            614 00292     658 20 7A02               STB     4,4
            615 00293     659 20     1285           LDA     10,5
            616 00294     660 20 5284               LDB     8,5
            617 00295     661 20     9984            AFD    8,3
            618 00296     662 20 3A05               STA     10,4
            619 00297     663 20     7A04           STB     8,4
            620 00298     664 20 5F180000           LDX     3,VECA3
            621 0029A     666 20 5F200002           LDX     4,VECA4
            622 0029C     668 20 5F280004           LDX     5,VECA5
            623 0029E     670 20 6C320006           IMP     6,6,M
```

```
                                                                SOURCE
VERSION K20A0503    DECK NAME=*SUBLIB*

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM
          624 00240   672 20  7300          RTA    0.6
          625                               DBASE  6
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                                              PAGE  20
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                              SOURCE
                                                *
                                                *
                                                ********
                                                ********VECTOR SUBTRACT ROUTINE
                                                ********CALLING SEQUENCE
                                                ********JS       VECSUB
                                                ********JRU       *+8
                                                ********PTR       V1
                                                ********PTR       V2
                                                ********PTR       V3
                                                ********
GENERATED                             0700
          627                                            EVEN
          628                                            ENTRY     VECSUB
          629                  20                        USE       20
          630                  24                        TEMP      24
          631 00090       144  24               VECS3    BSS       2
          632 00092       146  24               VECS4    BSS       2
          633 00094       148  24               VECS5    BSS       2
          634 00096       150  24               VECSTN   BSS       2
          635                  20                        USE       PREVIOUS
          636 002A2       674  20  03000000     VECSUB   PTR       0,6
          637 002A4       676  20  6C330006              IMN       6,6,M
          638 00090       144  24                          UBASE   6,VECS3
          639 002A6       678  20  1F180000              STX       3,VECS3
          640 002A8       680  20  1F200002              STX       4,VECS4
          641 002AA       682  20  1F280004              STX       5,VECS5
          642 002AC       684  20  5F280006              LDX       5,VECSTN
          643 002AE       686  20  36840006              LAE       6,5,I          POINTER TO RESULTANT VECTOR V3
          644 002B0       688  20  06A0                  LXA       4
GENERATED                             0700
          645 002B2       690  20  36840004              LAE       4,5,I          POINTER TO VECTOR V2
          646 002B4       692  20  0698                  LXA       3
GENERATED                             0700
          647 002B6       694  20  36840002              LAE       2,5,I          POINTER TO VECTOR V1
          648 002B8       696  20  06A8                  LXA       5
          649 002B9       697  20      1281              LDA       2,5
          650 002BA       698  20  52B0                  LDB       0,5
          651 002BB       699  20      0980              SFD       0,3
          652 002BC       700  20  3A01                  STA       2,4
          653 002BD       701  20      7A00              STB       0,4
          654 002BE       702  20  1283                  LDA       6,5
          655 002BF       703  20      52B2              LDB       4,5
          656 002C0       704  20  0982                  SFD       4,3
          657 002C1       705  20      3A03              STA       6,4
          658 002C2       706  20  7A02                  STB       4,4
          659 002C3       707  20      1285              LDA       10,5
          660 002C4       708  20  52B4                  LDB       8,5
          661 002C5       709  20      0984              SFD       8,3
          662 002C6       710  20  3A05                  STA       10,4
          663 002C7       711  20      7A04              STB       8,4
          664 002C8       712  20  5F180000              LDX       3,VECS3
          665 002CA       714  20  5F200002              LDX       4,VECS4
          666 002CC       716  20  5F280004              LDX       5,VECS5
```

```
VERSION K20A0503    DECK NAME=*SUBLIB*                    SOURCE

DIAGNOSTICS LINE ADDRES DADRES LC  PROGRAM
            667 U02CE   718 20 6C320006      IMP      6.6.M
            668 00200   720 20 7300          RTA      0.6
            669                              DBASE  6
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                     PAGE  22

DIAGNOSTICS LINE ADRES UADRES LC  PROGRAM                                 SOURCE
                                              *
                                              *
                                              *********
                                              *******    THIS SUBROUTINE ADDS TWO 3X3 MATRICIES
                                              *********CALLING SEQUENCE
                                              *********JS       MATDAD
                                              *********JRU       *+8
                                              *********PTR       V1
                                              *********PTR       V2
                                              *********PTR       V3
                                              *********
GENERATED                            0700
          671                                         EVEN
          672                                         ENTRY    MATDAD
          673                20                       USE      20
          674                24                       TEMP      24
          675 00098     152 24              MATD2   BSS      2
          676 0009A     154 24              MATD3   BSS      2
          677 0009C     156 24              MATD4   BSS      2
          678 0009E     158 24              MATD5   BSS      2
          679 000A0     160 24              MATRTN  BSS      2
          680                20                       USE      PREVIOUS
          681 002D2     722 20 03000000 MATDAD  PTR      0,6
          682 002D4     724 20 6C330006             IMN      6,8,M
          683 00098     152 24                        UBASE  6,MATD2
          684 002D6     726 20 1F100000               STX     2,MATD2           SAVE REGISTERS
          685 002D8     728 20 1F180002             STX      3,MATD3
          686 002DA     730 20 1F200004             STX      4,MATD4
          687 002DC     732 20 1F280006             STX      5,MATD5
          688 002DE     734 20 5F100006             LDX      2,MATRTN
          689 002E0     736 20 35040002             LAE      2,2,I             POINTER TO MATRIX V1
          690 002E2     738 20 0698                 LXA      3
GENERATED                            0700
          691 002E4     740 20 35040004             LAE      4,2,I             POINTER TO MATRIX V2
          692 002E6     742 20 0640                 LXA      4
GENERATED                            0700
          693 002E8     744 20 35040006             LAE      6,2,I             POINTER TO RESULTANT MATRIX V3
          694 002EA     746 20 0648                 LXA      5
GENERATED                            0700
          695 002EC     748 20 5C120002               LDX     2,2,M            INITIALIZE LOOP COUNTER
          696 002EE     750 20 1181         MATLOP LDA      2,3
          697 002EF     751 20      5180              LDB      0,3
          698 002F0     752 20 9400                 AFD      0,4
          699 002F1     753 20      3A81            STA      2,5
          700 002F2     754 20 7A80                 STB      0,5
          701 002F3     755 20      1183            LDA      6,3
          702 002F4     756 20 5182                 LDB      4,3
          703 002F5     757 20      9A02            AFD      4,4
          704 002F6     758 20 3A83                 STA      6,5
          705 002F7     759 20      7A82            STB      4,5
          706 002F8     760 20 1185                 LDA      10,3
          707 002F9     761 20      5184            LDB      8,3
          708 002FA     762 20 9A04                 AFD      8,4
          709 002FB     763 20      3A85            STA      10,5
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                          PAGE  23

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                 SOURCE
            710 002FC      764 20 7A84          STB      8,5
GENERATED                            0700
            711 002FE      766 20 6C1A000C      IMP      3,12,M
            712 00300      768 20 6C22000C      IMP      4,12,M
            713 00302      770 20 6C2A000C      IMP      5,12,M
            714 00304      772 20 6C130001        IMN     2,1,M          DECREMENT FOR NEXT PASS
            715 00306      774 20 643002EE      JGU      MATLOP
            716 00308      776 20 5F100000        LDX     2,MATD2        RESTORE REGISTERS FOR EXIT
            717 0030A      778 20 5F180002      LDX      3,MATD3
            718 0030C      780 20 5F200004      LDX      4,MATD4
            719 0030E      782 20 5F280006      LDX      5,MATD5
            720 00310      784 20 6C320008      IMP      6,8,M
            721 00312      786 20 7300          RTA      0,6
            722                                   DBASE   6
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                                                   PAGE  24

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
                                                   *
                                                   *      SINGLE PRECISION 3X3 MATRIX MULTIPLY ROUTINE
                                                   *      OPERATES ON THE SECOND WORD OF A DOUBLE PRECISION NUMBER.              *
                                                   *      CALLING CONVENTION IS AS FOLLOWS.                                      *
                                                   ******** JS     MULS33                                                        *
                                                   *******  JRU    *+8
                                                   ******** PTR    M1
                                                   ******** PTR    M2
                                                   ******** PTR    M3
            724                                             ENTRY  MULS33
            725                20                           USE    20
            726                24                           TEMP   24
            727 000A2    162 24              MULSX2         BSS    2
            728 000A4    164 24              MULSX3         BSS    2
            729 000A6    166 24              MULSX4         BSS    2
            730 000A8    168 24              MULSX5         BSS    2
            731 000AA    170 24              MULEND         BSS    2
            732 000AC    172 24              MULSTN         BSS    2
            733                20                           USE    PREVIOUS
GENERATED                             0700
            734 00314    788 20 03000000 MULS33         PTR    0,6
            735 00316    790 20 6C33000A                IMN    6,10,M
            736 000A2    162 24                         UBASE  6,MULSX2
            737 00318    792 20 1F100000                STX    2,MULSX2
            738 0031A    794 20 1F180002                STX    3,MULSX3
            739 0031C    796 20 1F200004                STX    4,MULSX4
            740 0031E    798 20 1F280006                STX    5,MULSX5
            741 00320    800 20 5F10000A                LDX    2,MULSTN
            742 00322    802 20 35040002                LAE    2,2,I
            743 00324    804 20 0698                    LXA    3                 (XR3)=ADDRESS OF MATRIX A
GENERATED                             0700
            744 00326    806 20 35040004                LAE    4,2,I
            745 00328    808 20 06A0                    LXA    4                 (XR4)=ADDRESS OF MATRIX B
GENERATED                             0700
            746 0032A    810 20 35040006                LAE    6,2,I
            747 0032C    812 20 06A8                    LXA    5                 (XR5)=ADDRESS OF MATRIX C
GENERATED                             0700
            748 0032E    814 20 6C2A0020                IMP    5,32,M
            749 00330    816 20 1F280008                STX    5,MULEND          END OF MATRIX FLAG
            750 00332    818 20 6C280020                IMN    5,32,M
            751 00334    820 20 5C120002                LDX    2,2,M             (XR2)=LOOP COUNTER
            752 00336    822 20 1181         MULS11         LDA    2,3
            753 00337    823 20      9201                   MLF    2,4
            754 00338    824 20 3A81                        STA    2,5
            755 00339    825 20      1187                   LDA    14,3
            756 0033A    826 20 9203                        MLF    6,4
            757 0033B    827 20      BA81                   ADF    2,5
            758 0033C    828 20 3A81                        STA    2,5
            759 0033D    829 20      118D                   LDA    26,3
            760 0033E    830 20 9205                        MLF    10,4
            761 0033F    831 20      BA81                   ADF    2,5
            762 00340    832 20 3A81                        STA    2,5
GENERATED                             0700
            763 00342    834 20 6C1A0004                IMP    3,4,M
```

```
VERSION K20A0503     DECK NAME=*SUBLIB*

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                            SOURCE
             764 00344    836 20 6C2A0004           IMP     5,4,M
             765 00346    838 20 6C130001           IMN     2,1,M
             766 00348    840 20 64300336           JGU     MULS11
             767 0034A    842 20 5C120002           LDX     2,2,M
             768 0034C    844 20 6C18000C           IMN     3,12,M
             769 0034E    846 20 6C22000C           IMP     4,12,M
             770 00350    848 20 27290008           ICL     5,MULEND
             771 00352    850 20 64300356           JGU     MULS22
             772 00354    852 20 64300336           JGU     MULS11
             773 00356    854 20 5F100000 MULS22    LDX     2,MULSX2
             774 00358    856 20 5F180002           LDX     3,MULSX3
             775 0035A    858 20 5F200004           LDX     4,MULSX4
             776 0035C    860 20 5F280006           LDX     5,MULSX5
             777 0035E    862 20 6C32000A           IMP     6,10,M
             778 00360    864 20 7300               RTA     0,6
             779                                    DBASE   6
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                              PAGE  26

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                          *
                                          *
                                          *********THIS PROGRAM MULT. A 3X3 BY A 3X3 MATRIX
                                          *********THE CALLING SEQUENCE US AS FOLLOWS
                                          *********     JS      MUL33
                                          **********    JRU     *+8
                                          *********     PTR     M1
                                          *********     PTR     M2
                                          *********     PTR     M3
GENERATED                       0700
            781                                    EVEN
            782                                    ENTRY   MUL33
            783              20                    USE     20
            784              24                    TEMP     24
            785 000AE    174 24           MU3SV    BSS      2
            786 000B0    176 24           MU32     BSS      2
            787 000B2    178 24           MU33     BSS      2
            788 000B4    180 24           MU34     BSS      2
            789 000B6    182 24           MU35     BSS      2
            790 000B8    184 24           MULKT    BSS     2                  END ADDRESS FOR MUL33
            791 000BA    186 24           MU3RTN   BSS      2
            792              20                    USE      PREVIOUS
            793 00362    866 20 03000000  MUL33    PTR      0.6
            794 00364    868 20 6C33000C             IMN     6.12.M
            795 000AE    174 24                      UBASE   6.MU3SV
            796 00366    870 20 1F100002           STX      2.MU32            SAVE REGISTERS
            797 00368    872 20 1F180004           STX      3.MU33
            798 0036A    874 20 1F200006           STX      4.MU34
            799 0036C    876 20 1F280008           STX      5.MU35
            800 0036E    878 20 5F10000C           LDX      2.MU3RTN          X2=RETURN ADDR.
            801 00370    880 20 35040002           LAE     2.2.I
            802 00372    882 20 0648               LXA     5                 X5= PTR TO INPUT MAT 1 =I
GENERATED                           0700
            803 00374    884 20 35040004           LAE     4.2.I
            804 00376    886 20 0640               LXA     4                 X4=PTR TO INPUT MAT 2 = J
GENERATED                           0700
            805 00378    888 20 35040006           LAE     6.2.I
            806 0037A    890 20 0698               LXA     3                 X3=PTR TO OUTPUT MAT =K
GENERATED                           0700
            807 0037C    892 20 5C120002             LDX     2.2.M           INITIALIZE LOOP COUNTER
            808 0037E    894 20 6C1A0020           IMP      3.32.M
            809 00380    896 20 1F18000A           STX      3.MULKT           SAVE END OF OUTPUT MATRIX
            810 00382    898 20 6C1B0020           IMN      3.32.M
            811 00384    900 20 1281      MUL33A   LDA      2.5               COMPUTE ONE ELEMENT OF OUTPUT
            812 00385    901 20     5280           LDB      0.5
            813 00386    902 20 640401CC           JS       MULFD
            814 00388    904 20 3981               STA      2.3
            815 00389    905 20     7980           STB      0.3
            816 0038A    906 20 1287               LDA      14.5
            817 0038B    907 20     5286           LDB      12.5
            818 0038C    908 20 6C220004           IMP      4.4.M             INCREMENT XR4
            819 0038E    910 20 640401CC           JS       MULFD
            820 00390    912 20 9980               AFD      0.3
            821 00391    913 20     3981           STA      2.3
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                                PAGE  27

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            822 00392    914 20 7980           STB      0,3
            823 00393    915 20       128D     LDA      26,5
            824 00394    916 20 528C           LDB      24,5
GENERATED                          0700
            825 00396    918 20 6C220004       IMP      4,4,M        INCREMENT XR4
            826 00398    920 20 640401CC       JS       MULFD
            827 0039A    922 20 9980           AFD      0,3
            828 0039B    923 20       3981     STA      2,3
            829 0039C    924 20 7980           STB      0,3
GENERATED                          0700
            830 0039E    926 20 6C230008         IMN      4,8,M      SET POINTERS FOR NEXT PASS
            831 003A0    928 20 6C1A0004         IMP      3,4,M
            832 003A2    930 20 6C2A0004         IMP      5,4,M
            833 003A4    932 20 6C130001         IMN      2,1,M      DECREMENT LOOP COUNTER
            834 003A6    934 20 64300384         JGU      MUL33A
            835 003A8    936 20 5C120002         LDX      2,2,M      RESET LOOP COUNTER AND POINTERS
            836 003AA    938 20 6C22000C         IMP      4,12,M
            837 003AC    940 20 6C2B000C         IMN      5,12,M
            838 003AE    942 20 2719000A         ICL      3,MULKT    CHECK FOR END OF MATRIX
            839 003B0    944 20 643003B4         JGU      MUL33C
            840 003B2    946 20 60AE             JU       MUL33A
GENERATED                          0700
            841 003B4    948 20 5F100002 MUL33C LDX     2,MU32          RESTORE REGS.
            842 003B6    950 20 5F180004       LDX      3,MU33
            843 003B8    952 20 5F200006       LDX      4,MU34
            844 003BA    954 20 5F280008       LDX      5,MU35
            845 003BC    956 20 6C32000C         IMP      6,12,M
            846 003BE    958 20 7300           RTA      0,6
            847                                  DBASE  6
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                                          PAGE  28

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                           SOURCE
                                                   *
                                                   *
                                                   ********* THIS PROGRAM MUL A3X3 MATRIX BY A3X1 VECTOR
                                                   *********  THE CALLING SEQUENCE IS AS FOLLOWS
                                                   *********  JS   MULD31
                                                   **********  JRU     *+8
                                                   *********  PTR  M1
                                                   *********  PTR  V1
                                                   *********  PTR  V2
GENERATED                                0700
            849                                          EVEN
            850                                          ENTRY      MULD31
            851                 20                       USE     20
            852                 24                       TEMP     24
            853 000BC       188 24               MUL1SV BSS     2
            854 000BE       190 24               MULS2  BSS     2
            855 000C0       192 24               MULS3  BSS     2
            856 000C2       194 24               MULS4  BSS     2
            857 000C4       196 24               MULS5  BSS     2
            858 000C6       198 24               MUL1TN BSS     2
            859                 20                       USE     PREVIOUS
            860 003C0       960 20 03000000 MULD31 PTR     0,6
            861 003C2       962 20 6C33000A        IMN     6,10,M
            862 000BC       188 24                   UBASE  6,MUL1SV
            863 003C4       964 20 1F100002        STX     2,MULS2          SAVE REGISTERS
            864 003C6       966 20 1F180004        STX     3,MULS3
            865 003C8       968 20 1F200006        STX     4,MULS4
            866 003CA       970 20 1F280008        STX     5,MULS5
            867 003CC       972 20 5F10000A        LDX     2,MUL1TN
            868 003CE       974 20 35040002        LAE    2,2,I         X5=PTR TO MATRIX=I
            869 003D0       976 20 06A8            LXA    5
GENERATED                                0700
            870 003D2       978 20 35040004        LAE    4,2,I         X4=PTR TO INPUT VECTOR=J
            871 003D4       980 20 06A0            LXA    4
GENERATED                                0700
            872 003D6       982 20 35040006        LAE    6,2,1         X3=PTR TO OUTPUT VECTOR=K
            873 003D8       984 20 0698            LXA    3
GENERATED                                0700
            874 003DA       986 20 5C120002        LDX     2,2,M         X2=ELEMENT COUNT
            875 003DC       988 20 1281    MUL31D LDA     2,5          DOUBLE PRECISION WORD
            876 003DD       989 20     5280        LDB     0,5
            877 003DE       990 20 640401CC        JS      MULFD
            878 003E0       992 20 3981            STA     2,3
            879 003E1       993 20     7980        STB     0,3
            880 003E2       994 20 1287            LDA     14,5
            881 003E3       995 20     5286        LDB     12,5
            882 003E4       996 20 6C220004        IMP     4,4,M      IX4=IX4+4
            883 003E6       998 20 640401CC        JS      MULFD
            884 003E8      1000 20 9980            AFD     0,3
            885 003E9      1001 20     3981        STA     2,3
            886 003EA      1002 20 7980            STB     0,3
            887 003EB      1003 20     1280        LDA     26,5
            888 003EC      1004 20 528C            LDB     24,5
GENERATED                                0700
```

VERSION K20A0503 DECK NAME=*SUBLIB*

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            889 003EE   1006 20 6C220004        IMP     4,4,M      IX4=IX4+4
            890 003F0   1008 20 640401CC        JS      MULFD
            891 003F2   1010 20 9980            AFD     0,3
            892 003F3   1011 20      3981       STA     2,3
            893 003F4   1012 20 7980            STB     0,3
GENERATED                           0700
            894 003F6   1014 20 6C230008        IMN     4,8,M
            895 003F8   1016 20 6C130001        IMN     2,1,M
            896 003FA   1018 20 64300408        JGU     MUL31C
            897 003FC   1020 20 5F100002        LDX     2,MULS2    RESTORE REGISTERS
            898 003FE   1022 20 5F180004        LDX     3,MULS3
            899 00400   1024 20 5F200006        LDX     4,MULS4
            900 00402   1026 20 5F280008        LDX     5,MULS5
            901 00404   1028 20 6C32000A        IMP     6,10,M
            902 00406   1030 20 7300            RTA     0,6
GENERATED                           0700
            903 00408   1032 20 6C1A0004 MUL31C IMP     3,4,M      K=K+4
            904 0040A   1034 20 6C2A0004        IMP     5,4,M
            905 0040C   1036 20 60B0            JU      MUL31D
            906                                   DBASE  6
            907                                   END
```

```
                STATISTICS

TOTAL SHORTS   436
TOTAL LONGS    224
TOTAL INSTRUCTIONS    660
PERCENT SHORT   66.1
GENERATED NOPS    49
THEORETICAL PERCENT NOP LOADING   13.7
ACTUAL PERCENT NOP LOADING    5.3
```

```
SECT NAME=SUMLIN*          *****ERROR MESSAGES*****

LINE NUMBER                DIAGNOSTIC
1    75.....ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
```

XREF 1 DECK NAME=*SUBLIB* SRC 2000 CROSS REFERENCE DICTIONARY PAGE 1

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
00036	54	24		ARG	250	303	304	307	308	312	362	363					
00048	72	24		ATNRTN	256												
0002A	42	24		ATNSV	245	260											
00042	66	24		ATNYT	254	289	290	294	295	360	361	366	367	371	377	386	387
						388											
00146	326	20		ATN0	292	286											
0014B	331	20		ATN1	297	284											
00151	337	20		ATN2	303	297											
0015E	350	20		ATN31	314	309											
00158	344	20		ATN3	310	306											
00169	361	20		ATN4	324	317											
00180	384	20		ATN5	341	323											
001B1	433	20		ATN6	384	365											
0005C	92	20		A0D	51	560											
00060	96	20		A1D	53	555	556										
00000	0	20		A1SC	3	79	80	163	187	188	262	263	529	530			
0002E	46	20		A1TN	27	353											
00002	2	20		A3SC	4	161											
00030	48	20		A3TN	28	350											
00004	4	20		A5SC	5	154											
00032	50	20		A5TN	29	347											
00006	6	20		A7SC	6	157											
00034	52	20		A7TN	30	344											
00008	8	20		A9SC	7	156											
00036	54	20		A9TN	31	341											
00016	22	20		BIT01	33	392											
0001C	28	20		BIT2	18	223											
0001E	30	20		BIT9	19	224											
00064	100	20		B1D	55	552											
000C4	196	20		B1IS2	153	101	106										
00040	64	24		C	253	322	340	357									
00014	20	24		COMRTN	72	153	165										
00026	38	20		C1	23	206											
0000A	10	20		C1S23	8	81	567										
00028	40	20		C2	24	207											
0003C	60	20		C31S23	35	359											
0011C	284	20		DECATN	258	241											
000D2	210	20		DECS0	183	169											
000E1	225	20		DECS1	194	192											
000F2	242	20		DECS2	210	216											
000EC	236	20		DECS3	205	201											
000FC	252	20		DECS4	217	204											
0002C	44	24		DETN1	246	261	381										
0002E	46	24		DETN4	247	264	380										
00012	18	20		DFONE	12	14	305	364	570								
00028	40	24		DSQRTN	161												
00018	24	24		DSQSV	173	165											
0021A	538	20		DVDOUT	503	506											
001F6	502	20		DVFD	469	283	313	335	379	459	558	569					
00222	546	20		EXP	524	509											
00020	32	20		EXPMOK	20	221	391										
00086	134	24		EXPRTN	522												
0006E	110	24		EXPSV	513	526											

XREF 1 DECK NAME=*SUBLIB* SRC 2000 CROSS REFERENCE DICTIONARY PAGE 2

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES										
0025A	602		20	EXP1	567	565										
0025C	604		20	EXP2	568	566										
00082	130		24	EXM1	520	528	577									
00084	132		24	EXM4	521	527	576									
0003A	58		20	E31	34	402										
00015	22		20	FMONE	15	33	95									
00014	20		20	FONE	13	310										
00036	56		20	FRACMS	32	401										
00119	281		20	IMARG	235	191										
0003E	62		20	IRT3T	36	331										
00058	88		20	LN2U2	49	546										
00054	84		20	LOG2E	47	531										
00020	32		24	M	177	197	199	205	210							
00018	24		20	MANTIS	16	195										
002D2	722		20	MATDAD	681	672										
00098	152		24	MATD2	675	683	684	716								
0009A	154		24	MATD3	676	685	717									
0009C	156		24	MATD4	677	686	718									
0009E	158		24	MATD5	678	687	719									
002EE	750		20	MATLOP	696	715										
000A0	160		24	MATRTN	679	688										
003C0	960		20	MULD31	860	850										
000AA	170		24	MULEND	731	749	770									
001CC	460		20	MULFD	422	229	333	412	532	547	551	574	813	819	826	877	883
						890										
000B8	184		24	MULRT	740	809	838									
001C8	454		20	MULOUT	452	455										
000AC	172		24	MULSTN	732	741										
000A2	162		24	MULSX2	727	736	737	773								
000A4	164		24	MULSX3	728	738	774									
000A6	166		24	MULSX4	729	739	775									
000A8	168		24	MULSX5	730	740	776									
00336	822		20	MULS11	752	766	772									
000BE	190		24	MULS2	854	863	897									
00356	854		20	MULS22	773	771										
000C0	192		24	MULS3	855	864	898									
00314	788		20	MULS33	734	724										
000C2	194		24	MULS4	856	865	899									
000C4	196		24	MULS5	857	866	900									
000BC	188		24	MULISV	853	862										
000C6	199		24	MULITN	858	867										
00408	1032		20	MUL31C	903	896										
003DC	988		20	MUL31D	875	905										
00362	866		20	MUL33	793	782										
00384	900		20	MUL33A	811	834	840									
00384	900		20	MUL33C	841	839										
000BA	186		24	MU3RTN	791	800										
000AE	174		24	MU3SV	785	795										
000B0	176		24	MU32	786	796	841									
000B2	178		24	MU33	787	797	842									
000B4	180		24	MU34	788	798	843									
000B6	182		24	MU35	789	799	844									
00078	120		24	N	516	538	575									

XREF 1 DECK NAME=SUBLIB SRC 2000 CROSS REFERENCE DICTIONARY PAGE 3

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
0001A	26	20	NONE	17	219											
001EC	492	20	NOFLO	451												
001FC	508	20	NZ1	474	472											
00205	517	20	NZ2	482	480											
0000C	12	20	ONE	9	198											
00110	272	20	OUT	230	193	237										
00042	66	20	PI	38	369	370	373	378								
00046	70	20	PI02	40	287	288	384	385								
0004A	74	20	PI06	42	334											
001F2	498	20	PRODZ	454	426	436										
00180	422	20	QD1	378	280	372	374									
00190	413	20	QD2	369	277											
001A1	417	20	QD3	373	269											
001A3	419	20	QD4	375	272											
00030	48	24	QLOC	248	270	273	278	281	291	296	368	389				
00138	312	20	QUAD1	280	276											
00132	305	20	QUAD12	275	266											
0012E	302	20	QUAD4	272	268											
0006C	108	24	RETD	467												
00055	85	24	RETM	420												
0004C	76	20	RT3T	43	326	332										
00098	152	20	SCDT8	114	111											
0009A	154	20	SCDTJ	115	114											
000BC	188	20	SCEX	149	125	134	142									
000A5	165	20	SCJ1	126	115											
000AE	174	20	SCJ2	135	116											
000B5	182	20	SCJ3	143	117											
0009D	157	20	SCJ4	118												
00016	22	24	SCTURN	73	96											
00068	104	20	SINCOS	75	59											
00000	0	24	SINSV	62	77											
0002A	42	20	SQRT2	25	227											
0001A	26	24	SQT1	174	188	232										
0001C	28	24	SQT2	175	189	230										
0001E	30	24	SQT4	176	190	231										
00138	315	20	START	282	271	274	279									
0005C	92	24	TA	463	477	482	484	488	494	501						
0004A	74	24	TAB	415	424	442	443	446	447	448	451					
00058	88	24	TAC	462	471	474	475	486	487	498	499					
00060	96	24	TH	464	485	490										
00026	38	24	TEMP2	180	218	225										
00024	36	24	TEMP	179	194	220										
00032	50	24	TEM1	249	265	292	298	299	302	327	328	334	355	394	396	399
00010	16	20	THREE	11	110											
00064	100	24	TP	465	491	492	495	496	497	500						
00068	104	24	TQ	466	478	489	493	502								
0000E	14	20	TWO	10												
00050	80	24	TXA	417	427	431	441	450								
0004E	78	24	TXB	416	429	432	433	445								
00054	84	24	TYA	419	435	444	449									
00052	82	24	TYB	418	430	439	440									
00002	2	24	T0SC	63	85	109	112	113								
00004	4	24	T1SC	64	83	88	90	97	155	158	160	162				

SKC 2000 CROSS REFERENCE DICTIONARY

XREF 1 DECK NAME=*SUBLIB*

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES
00006	5	24	T2SC	65 82 89 100 105 154 164
00008	8	24	T3SC	66 99 108 119 133 137 148
0000A	10	24	T4SC	67 98 104 107 118 147
0000C	12	24	T5SC	68 103 124 128 141 144
0000E	14	24	T6SC	69 102 140 143
00272	626	20	VECADD	542 584
0008E	142	24	VECATN	590 598
00088	136	24	VECA3	587 594 595 620
0008A	138	24	VECA4	588 596 621
0008C	140	24	VECA5	589 597 622
00096	150	24	VECSTN	634 642
002A2	674	20	VECSUB	636 628
00090	144	24	VECS3	631 638 639 664
00092	146	24	VECS4	632 640 665
00094	148	24	VECS5	633 641 666
00022	34	20	XC	21 200
00024	36	20	XE	22 203
001D2	466	20	XNZ	427 425
00070	112	24	XTD1	514 533 534 543 544 553 554 557 561 562 568
00074	116	24	XTD2	515 541 542 545
00010	16	24	X1SV	70 78 150
00012	18	24	X4SV	71 91 149
0007C	124	24	Y	518 549 563
001B8	440	20	YCOMP	390 320 338
0007A	122	24	YD	517 548 550 559 564
00050	80	20	YLIMIT	45 316
001DE	478	20	YNZ	437 435
00046	70	24	YTURN	255 390 407
00022	34	24	YO	178 208 211 212 214
0007E	126	24	Z	519 571 572 573
00012	18	20	ZERO	14 86 96 122 123 126 127 131 132 135 136 235 236 292 293 300 301 311 321 375 376 395 536
0021E	542	20	ZOOO	505 473 481
0003A	58	24	ZTN	251 314 315 318 319 324 325 329 330 336 337 354 400 404 405
0003E	62	24	ZT2N	252 342 345 348 351 406

VERSION R2040503 DECK NAME=*INIT *

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DIAGNOSTICS LINE ADRES OADRES LC  PROGRAM                                SOURCE
                                   $FAP INIT
                                   *
                                   *
                                   *    INITIALIZATION DATA AREA
                                   *
                                   *
                                   *    GEANS WORLD COMMON VARIABLES DATA AREA
                                   *
     1                        4    WLDCOM   COMMON  4
                                   *
     2 00000       0    4         SRT1     BSS     4          GYRO ROTOR 1 SPEED ACCUMULATION
     3 00004       4    4         SRT2     BSS     4          GYRO ROTOR 2 SPEED ACCUMULATION
     4 00008       8    4         RATM     BSS     4          NEGATIVE R.A.I. PULSE ACCUMULATION
     5 0000C      12    4         RATP     BSS     4          POSITIVE R.A.I. PULSE ACCUMULATION
     6 00010      16    4         ROT1     BSS     2          GYRO 1 ROTOR SPEED ( REV/SECOND )
     7 00012      18    4         ROT2     BSS     2          GYRO 2 ROTOR SPEED ( REV/SECOND )
     8 00014      20    4         DVAG     BSS     4          ACCUMULATED DELT VX
     9 00018      24    4         DVYG     BSS     4          ACCUMULATED DELT VY
    10 0001C      28    4         DVZG     BSS     4          ACCUMULATED DELT VZ
    11 00020      32    4         DPVV     BSS     4          DOPPLER VERTICAL VELOCITY ACCUMULATION
    12 00024      36    4         DPDV     BSS     4          DOPPLER DRIFT     VELOCITY ACCUMULATION
    13 00028      40    4         DPHV     BSS     4          DOPPLER HEADING   VELOCITY ACCUMULATION
    14 0002C      44    4         GMT      BSS     4          GREENWICH MEAN TIME
    15 00030      48    4         BTE1     BSS     2          BITE ACTUAL STATE MASK WORD 1
    16 00032      50    4         BTE3     BSS     2          BITE ACTUAL STATE MASK WORD 3
    17 00034      52    4         R1CT     BSS     2          COUNTER FOR ROTOR 1 SPEED FAULT
    18 00036      54    4         R2CT     BSS     2          COUNTER FOR ROTOR 2 SPEED FAULT
    19 00038      56    4         CIPM     BSS     2          INPUT POWER MONITOR COUNTER
    20 0003A      58    4         RAT      BSS     2          REDUNDANT AXIS TORQUING (PULSES)
    21 0003C      60    4         RATL     BSS     2          COUNTER FOR RAT
    22 0003E      62    4         DVX      BSS     4          INPUT DELTA VX
    23 00042      66    4         DVY      BSS     4          INPUT DELTA VY
    24 00046      70    4         DVZ      BSS     4          INPUT DELTA VZ
    25 0004A      74    4         CYLE     BSS     2          OUT-OF-TIME FLAG
    26 0004C      76    4         VRTV     BSS     2          DOPPLER VERTICAL VELOCITY
    27 0004E      78    4         DRFV     BSS     2          DOPPLER DRIFT     VELOCITY
    28 00050      80    4         HDGV     BSS     2          DOPPLER HEADING   VELOCITY
    29 00052      82    4         CTM1     BSS     2          PHASE TIMER
    30 00054      84    4         CTM2     BSS     2          INTERNAL SEQUENCING COUNTER
    31 00056      86    4         CTM3     BSS     2          INTERNAL SEQUENCING COUNTER
    32 00058      88    4         TIME     BSS     4          TIME FROM SYSTEM TURN ON (SECONDS)
    33 0005C      92    4         T0       BSS     4          TIME AT ENTRY TO NAV
    34 00060      96    4         ITER     BSS     2          ITERATION COUNTER
    35 00062      98    4         PHAS     BSS     2          AUTOMATIC SEQUENCING PHASE
    36 00064     100    4         NAVF     BSS     2          IN-NAVIGATION MODE FLAG (2/3 - MAN/AUTO)
    37 00065     102    4         DATA     BSS     2          SYSTEM DATA SWITCH (0-7)
    38 00068     104    4         PUSH     BSS     2          PUSHBUTTON SWITCH (0-31)
    39 0006A     106    4         TEST     BSS     2          PRESS TO TEST SWITCH (0/-1)
    40 0006C     108    4         MODE     BSS     2          SYSTEM MODE SWITCH
    41 0006E     110    4         LITE     BSS     2          CDU LIGHTS (SOFTWARE)
    42 00070     112    4         TMPR     BSS     2          TEMP STORAGE LOCATION
                                   *
                                   *    SOOL DATA AREA
                                   *
    43 00072     114    4         04F      BSS     2      01  FRAME MARKER
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VERSION K20A0503 DECK NAME=*INIT *

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM				SOURCE	
44	00074	116	4		040	BSS	2	02	MSH OF GMT
45	00076	118	4		041	BSS	2	03	LSH OF GMT
46	00078	120	4		042	BSS	2	04	MSH OF LATITUDE
47	0007A	122	4		043	BSS	2	05	LSH OF LATITUDE
48	0007C	124	4		044	BSS	2	06	MSH OF LONGITUDE
49	0007E	126	4		045	BSS	2	07	LSH OF LONGITUDE
50	00080	128	4		047	BSS	2	08	MSH OF VERTICAL VELOCITY
51	00082	130	4		048	BSS	2	09	LSH OF VERTICAL VELOCITY
52	00084	132	4		049	BSS	2	10	MSH OF EAST VELOCITY
53	00086	134	4		04A	BSS	2	11	LSH OF EAST VELOCITY
54	00088	136	4		04B	BSS	2	12	MSH OF NORTH VELOCITY
55	0008A	138	4		04C	BSS	2	13	LSH OF NORTH VELOCITY
56	0008C	140	4		046	BSS	2	14	I.N.S. ALTITUDE
57	0008E	142	4		06C	BSS	2	15	AHRS HEADING
58	00090	144	4		060	BSS	2	16	AHRS PITCH
59	00092	146	4		06E	BSS	2	17	AHRS ROLL
60	00094	148	4		018	BSS	2	18	RESET,IMU,DPU,EAU,CDU,DCU,BATT BITE BITS
61	00096	150	4		030	BSS	2	19	3RD,4TH,5TH,6TH, RIGHT NUMERIC
62	00098	152	4		031	BSS	2	20	4 DISCRETES; R.ALPHA; 1ST,2ND R. NUMERIC
63	0009A	154	4		032	BSS	2	21	2ND,3RD,4TH,5TH LEFT NUMERIC
64	0009C	156	4		033	BSS	2	22	1ST,2ND WAYPOINT; L. ALPHA; 1ST L.NUMERIC
65	0009E	158	4		034	BSS	2	23	1ST,2ND FROM< 1ST,2ND TO
66	000A0	160	4		035	BSS	2	24	CDU/ACDU DISPLAY LIGHTS
67	000A2	162	4		023	BSS	2	25	HEADING
68	000A4	164	4		021	BSS	2	26	PITCH
69	000A6	166	4		022	BSS	2	27	ROLL
70	000A8	168	4		024	BSS	2	28	STEERING SIGNAL
71	000AA	170	4			BSS	2	29	BLANK
72	000AC	172	4		014	BSS	2	30	SEQ CNT,G1,2 RED,G1,2 TERM SHUTDOWN BITS
73	000AE	174	4		072	BSS	2	31	TORQUE FOR GIMBALS 1 AND 2
74	000B0	176	4		071	BSS	2	32	TORQUE FOR GIMBALS 3 AND 4
75	000B2	178	4		040	BSS	2	33	ROTOR 1,2, ROTOR SPEED
76	000B4	180	4		04E	BSS	2	34	RAT AND VERTICAL VELOCITY
77	000B6	182	4		050	BSS	2	35	-,+ DELTA VX
78	000B8	184	4		051	BSS	2	36	-,+ DELTA VY
79	000BA	186	4		052	BSS	2	37	-,+ DELTA VZ
80	000BC	188	4		053	BSS	2	38	GIMBAL 1 RESOLVER
81	000BE	190	4		054	BSS	2	39	GIMBAL 2 RESOLVER
82	000C0	192	4		055	BSS	2	40	GIMBAL 3 RESOLVER
83	000C2	194	4		056	BSS	2	41	GIMBAL 4 RESOLVER
84	000C4	196	4		058	BSS	2	42	DATA,MODE,TST AND PUSHBUTTON SWITCHES
85	000C6	198	4		050	BSS	2	43	BITE BITS
86	000C8	200	4		05E	BSS	2	44	BITE BITS
87	000CA	202	4		025	BSS	2	45	BAROMETRIC ALTITUDE AND BITE BITS
88	000CC	204	4		060	BSS	2	46	DRIFT AND HEADING VELOCITY
89	000CE	206	4			BSS	2	47	SPARE
90	000D0	208	4			BSS	2	48	SPARE
91	000D2	210	4		05A	BSS	2	49	DELTA LATITUDE (FIX)
92	000D4	212	4		062	BSS	2	50	DELTA LONGITUDE (FIX)
93	000D6	214	4		057	BSS	2	51	VERTICAL DIFFERENCE VELOCITY
94	000D8	216	4		058	BSS	2	52	CROSS TRACK DIFFERENCE VELOCITY
95	000DA	218	4		059	BSS	2	53	ALONG TRACK DIFFERENCE VELOCITY
96	000DC	220	4		063	BSS	2	54	A11 ALIGNMENT MATRIX
97	000DE	222	4		064	BSS	2	55	A21 ALIGNMENT MATRIX
98	000E0	224	4		065	BSS	2	56	A31 ALIGNMENT MATRIX

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VERSION K20A0503     DECK NAME=*INIT  *                                                                    PAGE   3

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
             99 000E2    226  4           066       BSS     2          57   A12 ALIGNMENT MATRIX
            100 000E4    228  4           067       BSS     2          58   A22 ALIGNMENT MATRIX
            101 000E6    230  4           068       BSS     2          59   A32 ALIGNMENT MATRIX
            102 000E8    232  4           069       BSS     2          60   A13 ALIGNMENT MATRIX
            103 000EA    234  4           06A       BSS     2          61   A23 ALIGNMENT MATRIX
            104 000EC    236  4           06B       BSS     2          62   A33 ALIGNMENT MATRIX
            105 000EE    238  4                     BSS     2          63   SPARE
            106 000F0    240  4                     BSS     2          64   SPARE
            107 000F2    242  4           AJ        BSS     36              ALIGNMENT MATRIX
                                          *
            108                5          NIACOM    COMMON 5                NAV.INIT.AND ALIGN COMMON DATA
                                          *
                                          *   DELTA V'S IN I.J.K SPACE IN M/SEC/CC
                                          *
            109 00000      0  5           DVXI      BSS     4
            110 00004      4  5           DVYJ      BSS     4
            111 00008      8  5           DVZK      BSS     4
            112 0000C     12  5           A         BSS     36              TEMP 3X3 MATRIX A
            113 0000C     12  5           DCAR      EQU     A
            114 00030     48  5           FLGN      BSS     2               SAVE AJ(I.J) FLAG
            115 00032     50  5           SAVT      BSS     4               TIME OF LAST AJ ROTATION
            116 00036     54  5           ASCH      BSS     2               ALIGNMENT SCHEDULER
            117 00036     54  5           NSCH      EQU     ASCH            NAVIGATION SCHEDULER
            118 00038     56  5           CD04D     BSS     12              CD0(I)*DELT    I=4.6
                                          *
            119                6          NICOM     COMMON 6                NAV AND INIT COMMON DATA
                                          *
            120 00000      0  6           RAD       BSS     4               RADIUS IN METERS
            121 00004      4  6           RXYZ      BSS     4               SQRT(X**2+Y**2+Z**2)
            122 00008      8  6           LAT       BSS     4               EARTH RELATIVE LATITUDE
            123 0000C     12  6           LONG      BSS     4               EARTH RELATIVE LONGITUDE
            124 00010     16  6           DCON      BSS     2               CLOCK CYCLE COUNTER
            125 00012     18  6           CHAJ      BSS     2
                                          *
                                          *   VELOCITY IN INERTIAL SPACE IN M/SEC
                                          *
            126 00014     20  6           VX        BSS     4
            127 00018     24  6           VY        BSS     4
            128 0001C     28  6           VZ        BSS     4
            129 00020     32  6           LONB      BSS     4               LONGITUDE DISPLAY BIAS
            130 00024     36  6           LATB      BSS     4               LATITUDE DISPLAY BIAS
            131 00028     40  6           LGO       BSS     4               LONGITUDE AT ENTRY TO NAV
            132 0002C     44  6           S2GC      BSS     4               (SIN(GEOCENTRIC LATITUDE))**2
            133 00030     48  6           C2GC      BSS     4               (COS(GEOCENTRIC LATITUDE))**2
            134 00034     52  6           SGCL      BSS     4               SIN(GEOCENTRIC LATITUDE)
            135 00038     56  6           CGCL      BSS     4               COS(GEOCENTRIC LATITUDE)
            136 0003C     60  6           AB        BSS     36              (SCALE FACTOR)*(ALPHA-BETA) MATRIX AB
            137 00060     96  6           GM        BSS     36
            138 00084    132  6           VI        BSS     36              POSITION UPDATE MATRIX
            139 000A8    168  6           TEM       BSS     12
            140 000B4    180  6           TEM0      BSS     4
            141 000B8    184  6           TEM1      BSS     4
            142 000BC    188  6           TEM2      BSS     4
                                          *  POSITION IN INERTIAL SPACE. METERS
                                          *
```

```
VERSION K20A0503     DECK NAME=*INIT  *                                                                    PAGE   4

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
            143 000C0    192  6          X         BSS     4
            144 000C4    196  6          Y         BSS     4
            145 000C8    200  6          Z         BSS     4
                                         *
                                         *   SUMMATION OF DELTA V'S IN I.J.K SPACE IN M/SEC/CC
                                         *
            146 000CC    204  6          SDVI      BSS     4
            147 000D0    208  6          SDVJ      BSS     4
            148 000D4    212  6          SDVK      BSS     4
            149 000D8    216  6          TLPO      BSS     4                TIME OF LAST PRINTOUT
                                         *
            150                   8      IACOM     COMMON  8                INIT AND ALIGN DECKS COMMON DATA
                                         *
            151 00000      0  8          VAXI      BSS     12
            152 0000C     12  8          AK1T      BSS     4                G*DT*COS(LAT)
            153 00010     16  8          AK2T      BSS     4                G*DT*SIN(LAT)
            154 00014     20  8          PHA       BSS     4                PHASE ANGLE LAG OF FILTER IN PI RAD
            155 00018     24  8          VAX       BSS     12               SUM OF DVX.DVY.DVZ ERRORS IN M/SEC
            156 0001C     28  8          VAY       EQU     VAX+4
            157 00020     32  8          VAZ       EQU     VAX+8
            158 00024     36  8          NCCD      BSS     2                NUMBER OF CLOCK CYCLES COUNTING FROM
                                         *                                  A NEGATIVE NUMBER
            159 00026     38  8          SAMI      BSS     2                SELECT ALIGN MODE INDEX
            160 00028     40  8          MCSI      BSS     2                MODE C SOLUTION INDEX
            161 0002A     42  8          NCCU      BSS     4                NUMBER OF COMPUTER CYCLES INTO MODE
            162 0002E     46  8          XA        BSS     8
            163 00036     54  8          XB        BSS     8
            164 0003E     62  8          XC        BSS     8
            165 00046     70  8          YA1       BSS     4                SUMMATION (EDVX)
            166 0004A     74  8          YA2       BSS     4                SUMMATION (EDVX*SIN(THR))
            167 0004E     78  8          YB1       BSS     4                SUMMATION (EDVY)
            168 00052     82  8          YB2       BSS     4                SUMMATION (EDVY*OMEGA*TIME)
            169 00056     86  8          YC1       BSS     4                SUMMATION (EDVZ*COS(THR))
            170 0005A     90  8          YC2       BSS     4                SUMMATION (EDVZ*SIN(THR))
            171 00046     70  8          YA        EQU     YA1
            172 0005E     94  8          VTB       BSS     4                LOCAL GRAVITY*8.0
            173 00062     98  8          VTC       BSS     4                GL*DELT
            174 00066    102  8          VC1X      BSS     36
            175 00072    114  8          VC2X      EQU     VC1X+12
            176 0007E    126  8          VC3X      EQU     VC1X+24
            177 0008A    138  8          VF1X      BSS     36
            178 00096    150  8          VF2X      EQU     VF1X+12
            179 000A2    162  8          VF3X      EQU     VF1X+24
                                         *
                                         *
            180                   7      MATCOM    COMMON  7                MATRIX.VECTOR.AND MISCELLANEOUS DATA
                                         *
            181 00000      0  7          SWT       BSS     4                SIN(OMEGA T)
            182 00004      4  7          CWT       BSS     4                COS(OMEGA T)
            183 00008      8  7          SGDL      BSS     4                SIN(GEODETIC LATITUDE)
            184 0000C     12  7          CGDL      BSS     4                COS(GEODETIC LATITUDE)
            185 00010     16  7          ALT       BSS     4                ALTITUDE
                                         *
                                         *    GIMBAL RESOLVER POSITION (BIAS EXCLUDED)
                                         *
```

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VERSION K20A0503      DECK NAME=*INIT  *                                                           PAGE    5

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            186 00014    20  7        RES1     BSS    4
            187 00018    24  7        RES2     BSS    4
            188 0001C    28  7        RES3     BSS    4
            189 00020    32  7        RES4     BSS    4
            190 00024    36  7        SRA      BSS    8          SUM OF 1-(G KNOWN)/(G ACCELERATION)
            191 0002C    44  7        N40      BSS    2
                                      *
                                      *     COSINES OF CORRECTED GIMBAL ANGLES
                                      *
            192 0002E    46  7        C1       BSS    4
            193 00032    50  7        C2       BSS    4
            194 00036    54  7        C3       BSS    4
            195 0003A    58  7        C4       BSS    4
                                      *
                                      *     SINES OF CORRECTED GIMBAL ANGLES
                                      *
            196 0003E    62  7        S1       BSS    4
            197 00042    66  7        S2       BSS    4
            198 00046    70  7        S3       BSS    4
            199 0004A    74  7        S4       BSS    4
                                      *
            200 0004E    78  7        KSN1     BSS    2          GAIN COLUMN INDEX
            201 00050    80  7        KSN2     BSS    2          GAIN COLUMN INDEX
            202 00052    82  7        KSN3     BSS    2          GAIN COLUMN INDEX
            203 00054    84  7        D1       BSS    36         TEMP 3X3 MATRIX
            204 00078   120  7        DG       BSS    36         TOTAL GIMBAL AND THEN TSP2
                                      *
                                      *     STATE MATRIX ( STORED ROW MAJOR ORDER )
                                      *****      E11 = PSI = HEADING
                                      *****      E12 = THETA = PITCH
                                      *****      E13 = PHI = ROLL
                                      *
                                      *
            205 0009C   156  7        E1       BSS    12
            206 000A8   168  7        E2       BSS    12
            207 000B4   180  7        E3       BSS    12
            208 000C0   192  7        OC       BSS    36         VEHICLE TO CASE TRANSFORMATION MATRIX
            209 000E4   228  7        D        BSS    36         TEMP 3X3 MATRIX
            210 00108   264  7        SA       BSS    36         SAVE AJ MATRIX
            211 0012C   300  7        TM       BSS    36         TEMP 3X3 MATRIX
            212 00150   336  7        TM1      BSS    36         TEMP 3X3 MATRIX
            213 00174   372  7        VECT     BSS    34         TABLE OF SUBROUTINE CALLS
            214 00150   336  7        AP       EQU    TM1        TEMP 3X1 VECTOR
            215 0015C   348  7        AT       EQU    TM1+12     TEMP 3X1 VECTOR
            216 000E4   228  7        J3X3     EQU    D
            217 00150   336  7        K3X3     EQU    TM1
            218 00054    84  7        L3X3     EQU    D1
            219 00024    36  7        LCA1     EQU    SRA        LAST GIMBAL 1 COMMAND
            220 00028    40  7        LCA4     EQU    SRA+4      LAST GIMBAL 4 COMMAND
            221 00008     8  7        SL       EQU    SGDL       SIN(LAT) GEODETIC
            222 0000C    12  7        CL       EQU    CGDL       COS(LAT) GEODETIC
                                      *
                                      *
                                      *     GEANS WORLD COMMON CONSTANTS DATA AREA
                                      *
```

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VERSION K20A0503      DECK NAME=*INIT  *                                                              PAGE   6

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            223                9          CONCOM    COMMON  9
                                          *
            224 00000      0   9 FFFFFFC0 V64       DEC     -64
            225                                     EVEN
R           226 00002      2   9          DCSK      BSS     2
            227 00004      4   9          NFOUR     BSS     2
            228 00006      6   9          NTWO      BSS     2
            229 00008      8   9          NONE      BSS     2
            230 0000A     10   9          ONE       BSS     2
            231 0000C     12   9          TWO       BSS     2
            232 0000C     12   9          FASI      EQU     TWO      10/15 MINUTE (2/3) FINE ALIGNMENT POINTER
            233 0000E     14   9          THREE     BSS     2
            234 00010     16   9          FOUR      BSS     2
            235 00012     18   9          SIX       BSS     2
            236 00014     20   9          SEVEN     BSS     2
            237 00016     22   9          EIGHT     BSS     2
            238 00018     24   9          NINE      BSS     2
            239 0001A     26   9          TEN       BSS     2
            240 0001C     28   9          ZERO      BSS     2
            241 0001E     30   9          FONE      BSS     2
            242 0001C     28   9          DFONE     EQU     ZERO
            243                                     EVEN
            244 00020     32   9          ONHLF     BSS     4
            245 00024     36   9          OMGA      BSS     4        EARTH ROTATION RATE  RAD/SEC
            246 00028     40   9          OMEG      BSS     4         EARTH RATE   PI RAD/SEC
            247 0002C     44   9          KGDL      BSS     4        GEODETIC LATITUDE CONSTANT
            248 00030     48   9          DELT      BSS     4        DELTA TIME = 1/8 SECOND
            249 00034     52   9          D1032     BSS     4        DOUBLE PRECISION 1/32
            250 00038     56   9          D3032     BSS     4        =3/32
                                          *
                                          *    CALIBRATION DATA.    CD01-CD64
                                          *
            251                                     EVEN
            252 0003C     60   9          CD01      BSS     4        X ACCEL SCALE FACTOR  M/SEC/PULSE
            253 00040     64   9          CD02      BSS     4        Y ACCEL SCALE FACTOR  M/SEC/PULSE
            254 00044     68   9          CD03      BSS     4        Z ACCEL SCALE FACTOR  M/SEC/PULSE
            255 00048     72   9          CD04      BSS     4        X ACCEL BIAS   PULSE/SEC
            256 0004C     76   9          CD05      BSS     4        Y ACCEL BIAS   PULSE/SEC
            257 00050     80   9          CD06      BSS     4        Z ACCEL BIAS   PULSE/SEC
            258 00054     84   9          CD07      BSS     4        B11 ACCEL MISALIGNMENT
            259 00058     88   9          CD08      BSS     4        B12 ACCEL MISALIGNMENT
            260 0005C     92   9          CD09      BSS     4        B13 ACCEL MISALIGNMENT
            261 00060     96   9          CD10      BSS     4        B21 ACCEL MISALIGNMENT
            262 00064    100   9          CD11      BSS     4        B22 ACCEL MISALIGNMENT
            263 00068    104   9          CD12      BSS     4        B23 ACCEL MISALIGNMENT
            264 0006C    108   9          CD13      BSS     4        B31 ACCEL MISALIGNMENT
            265 00070    112   9          CD14      BSS     4        B32 ACCEL MISALIGNMENT
            266                                     EVEN
            267 00074    116   9          CD15      BSS     4        B33 ACCEL MISALIGNMENT
            268 00078    120   9          CD16      BSS     4        GYRO TORQUE.G INDEPEN.DYNE-CM
            269 0007C    124   9          CD17      BSS     4        GYRO TORQUE.G INDEPEN.DYNE-CM
            270 00080    128   9          CD18      BSS     4        GYRO TORQUE.G INDEPEN.DYNE-CM
            271 00084    132   9          CD19      BSS     4        G11 GYRO TORQUE.G DEPEN.DYNE-CM/SEC**2
            272 00088    136   9          CD20      BSS     4        G12 GYRO TORQUE.G DEPEN.DYNE-CM/SEC**2
            273 0008C    140   9          CD21      BSS     4        G13 GYRO TORQUE.G DEPEN.DYNE-CM/SEC**2
```

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VERSION K2040503      DECK NAME=*INIT  *                                                                          PAGE   7

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                       SOURCE
            274 00090   144  9          CD22      BSS    4            G21 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            275 00094   148  9          CD23      BSS    4            G22 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            276 00098   152  9          CD24      BSS    4            G23 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            277 0009C   156  9          CD25      BSS    4            G31 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            278 000A0   160  9          CD26      BSS    4            G32 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            279 000A4   164  9          CD27      BSS    4            G33 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            280 000A8   168  9          CD28      BSS    4            RAT GYRO TORQUE  DYNE-CM
            281 000AC   172  9          CD29      BSS    4            RAT GYRO TORQUE  DYNE-CM
            282 000B0   176  9          CD30      BSS    4            SPEED COMP,G INDEPENDENT  DYNE-CM
            283 000B4   180  9          CD31      BSS    4            SPEED COMP,G INDEPENDENT  DYNE-CM
            284 000B8   184  9          CD32      BSS    4            SPEED COMP,G INDEPENDENT  DYNE-CM
            285 000BC   188  9          CD33      BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            286 000C0   192  9          CD34      BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            287 000C4   196  9          CD35      BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            288 000C8   200  9          CD36      BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            289 000CC   204  9          CD37      BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            290 000D0   208  9          CD38      BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            291 000D4   212  9          CD39      BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            292                                   EVEN
            293 000D8   216  9          CD40      BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            294 000DC   220  9          CD41      BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            295 000E0   224  9          CD42      BSS    4            A18P RAT SPEED COMP  DYNE-CM
            296 000E4   228  9          CD43      BSS    4            A19P RAT SPEED COMP  DYNE-CM
            297 000E8   232  9          CD44      BSS    4            STARTING LOCUS            PI RADIANS
            298 000EC   236  9          CD45      BSS    4            BETA(1Z) MISALIGNMENT   PI RADIANS
            299 000F0   240  9          CD46      BSS    4            GIMBAL 1 RESOLVER BIAS  PI RADIANS
            300 000F4   244  9          CD47      BSS    4            GIMBAL 2 RESOLVER BIAS  PI RADIANS
            301 000F8   248  9          CD48      BSS    4            GIMBAL 3 RESOLVER BIAS  PI RADIANS
            302 000FC   252  9          CD49      BSS    4            GIMBAL 4 RESOLVER BIAS  PI RADIANS
            303 00100   256  9          CD50      BSS    4            PLATFORM AZIMUTH ALIGN IN PI RADIANS
            304 00104   260  9          CD51      BSS    4            PLATFORM ELEVATION ALIGN IN PI RADIANS
            305 00108   264  9          CD52      BSS    4            VERTICAL DAMPING CONSTANT,
                                        *                             0.59594852 IN M/SEC/M*2**31
            306 0010C   268  9          CD53      BSS    4            VERTICAL VELOCITY GAIN    UNITLESS
            307 00110   272  9          CD54      BSS    4            LOADED HEADING            PI RADIANS
            308 00114   276  9          LATL      BSS    4            LOADED LATITUDE IN PI RADIANS = CD55
            309 00114   276  9          CD55      EQU    LATL
            310 00118   280  9          LONL      BSS    4            LOADED LONGITUDE IN PI RADIANS = CD56
            311 00118   280  9          CD56      EQU    LONL
            312 0011C   284  9          GL        BSS    4            LOCAL GRAVITY IN METERS/SEC**2 = CD57
            313 0011C   284  9          CD57      EQU    GL
            314 00120   288  9          CD58      BSS    4            1/SCALE FACTOR            PULSES/M/SEC
            315 00124   292  9          CD59      BSS    4            ROTOR 1 SPEED        REVOLUTIONS/SEC
            316 00128   296  9          CD60      BSS    4            ROTOR 2 SPEED        REVOLUTIONS/SEC
            317 0012C   300  9          CD61      BSS    4            BARO ALT SCALE FACTOR   METERS/BIT
            318 00130   304  9          CD62      BSS    4            BARO ALTITUDE BIAS        BITS
            319 00134   308  9          CD63      BSS    4            ALTIMETER / AHRS FLAGS  NONE
            320 00138   312  9          CD64      BSS    4            ALTITUDE                  METERS
                                        *
            321                                   EVEN
            322                  1                USE    1
            323 00000     0  1          IBM       BSS    2            RETURN ADDRESS LOCATION FOR ATTITUDE
            324 00002     2  1          IOM       BSS    2            RETURN ADDRESS LOCATION FOR FENT
            325 00004     4  1          IIOM      BSS    2            RETURN ADDRESS LOCATION FOR RSET
            326 00006     6  1          IISM      BSS    2            RETURN ADDRESS LOCATION FOR NAVI
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VERSION K20A0503      DECK NAME=*INIT  *                                                                      PAGE   8

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                            SOURCE
            327 00008     8  1            FG       BSS    36            TEMP - FIRST HALF GIMBAL ANGLE
            328 0002C    44  1            LG       BSS    36            TEMP - LAST HALF GIMBAL ANGLE
                                          *
                                          *
                                          *    RESIDUAL ATTITUDE ANGLES
                                          *
            329 00050    80  1            RT1      BSS    4
            330 00054    84  1            RT2      BSS    4
            331 00058    88  1            RT3      BSS    4
            332 00050    80  1            RT       EQU    RT1
            333 0005C    92  1            RTL      BSS    12
            334 00068   104  1            HEAD     BSS    4             HEADING
                                          *
            335                 2                  USE    2
                                          *
            336 00000     0  2 FFFFE3E0 N7200      DEC    -7200
            337 00002     2  2 FFFFED40 N4800      DEC    -4800
            338 00004     4  2 FFFFF970 N1680      DEC    -1680
            339 00006     6  2 FFFFFB50 N1200      DEC    -1200
            340 00008     8  2 00000000 RMX        DEC    0
            341 0000A    10  2 00000000 DRMX       DEC    0
            342 0000C    12  2 3FC00000 DEG45      DEC    0.25          45 DEGREES IN PI RADIANS
            343 0000E    14  2 FC24FF12 DEG49      DEC64  0.27222222    49 DEGREE LATITUDE REFERENCE,PI RADIANS
                                 3FC5B05A
            344 00012    18  2 00000000 DF8        DEC64  8.0           DOUBLE PRECISION 8.0
                                 42400000
R           345 00016    22  2 64040000 JNAV       JS     IA
            346 00018    24  2 64040000 JALN       JS     IIA
                                          *
                                          *    GAIN MATRIX KS(I.J) (STORED IN ROW MAJOR ORDER)
                                          *
            347 0001A    26  2 00000000 KS1        DEC64  1.0
                                 40C00000
            348 0001E    30  2 D58C8EEF            DEC64  0.999997
                                 407FFFE6
            349 00022    34  2 CEFED634            DEC64  0.999297
                                 407FE8F6
            350 00026    38  2 18EF49CF            DEC64  0.956890
                                 407A785F
            351 0002A    42  2 9AC8C8C0            DEC64  0.795909
                                 4065E058
            352 0002E    46  2 4E3FFEF3            DEC64  0.673358
                                 40563098
            353 00032    50  2 9A8CDEA0            DEC64  0.543539
                                 404592AF
            354 00036    54  2 E5FB71FB            DEC64  0.465173
                                 3FF71593
            355 0003A    58  2 6466B1E5            DEC64  0.377862
                                 3FE0B890
            356 0003E    62  2 ABEAD4F5            DEC64  0.332072
                                 3FD502AB
            357 00042    66  2 00000000 KS2        DEC64  0
                                 00000000
            358 00046    70  2 150F3F96            DEC64  32.025727
                                 434000D2C
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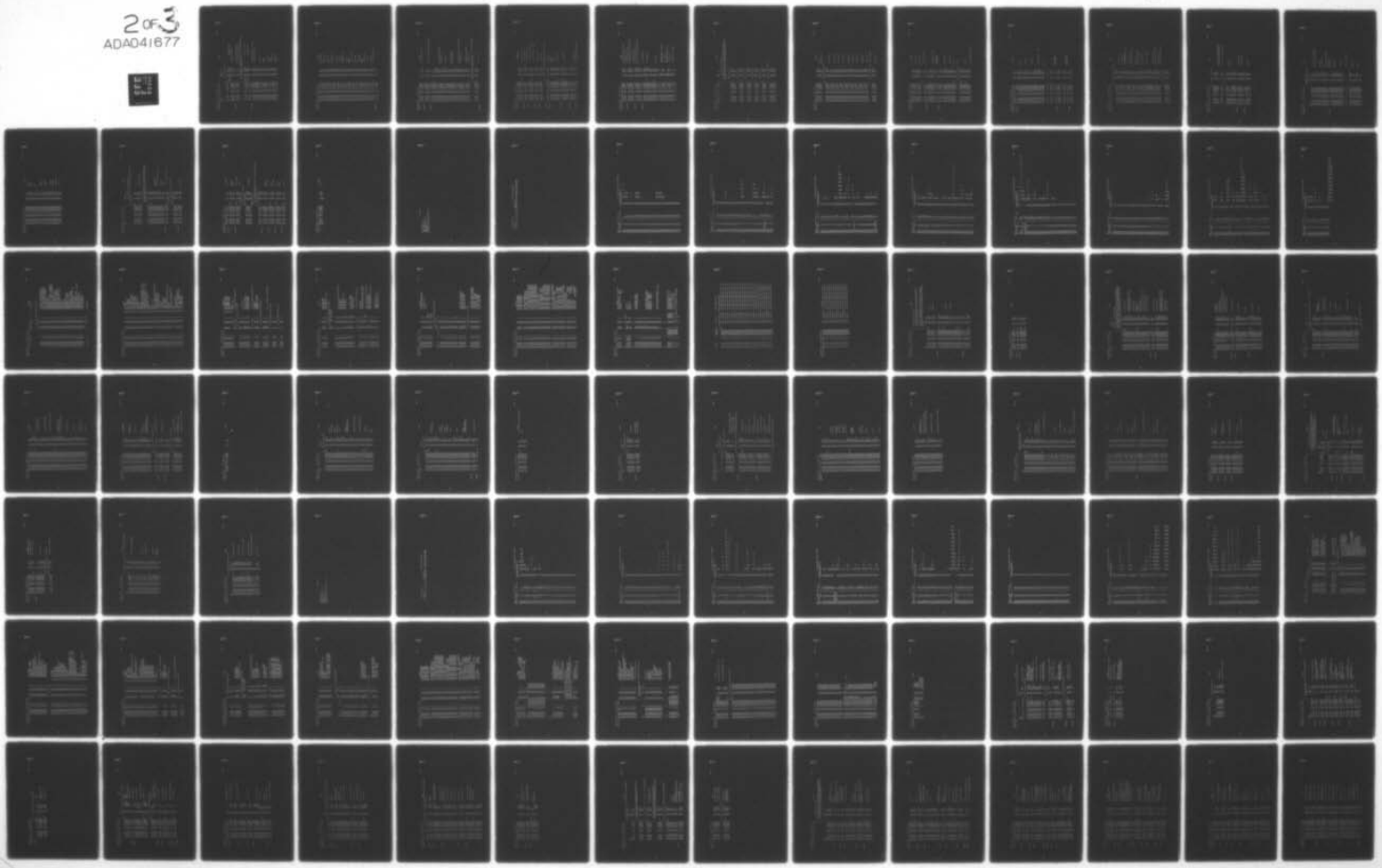
VERSION K20A0503 DECK NAME=*INIT *

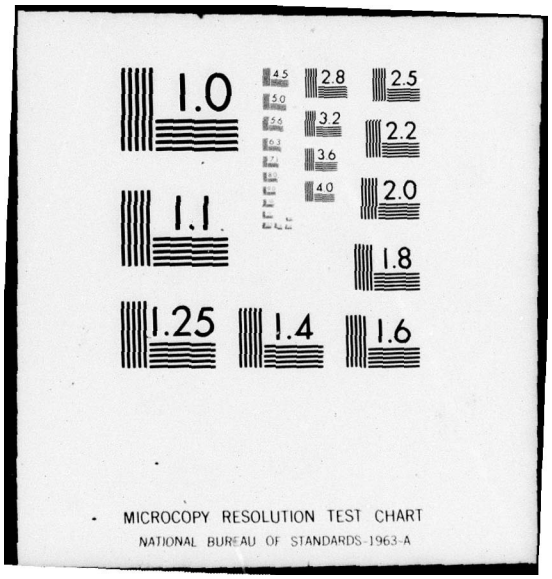
DIAGNOSTICS LINE	ADRES	OADRES	LC	PROGRAM		SOURCE	
359	0004A	74	2	CH6848BE 435FB4B9		DEC64	47.852980
360	0004E	78	2	4E2F37FA 43449570		DEC64	34.291964
361	00052	82	2	2C94B380 42C10127		DEC64	16.251126
362	00056	86	2	B5675579 424DDEC0		DEC64	9.733766
363	0005A	90	2	7942DB3D 41D6871F		DEC64	5.407989
364	0005E	94	2	58601366 41737CFE		DEC64	3.509008
365	00062	98	2	37E6F71A 4144344C		DEC64	2.131384
366	00066	102	2	9F98B718 40E29A1B		DEC64	1.540656
367	0006A	106	2	00000000 00000000	KS3	DEC64	0
368	0006E	110	2	C41DD1A0 40EA14CE		DEC64	1.557520
369	00072	114	2	EB1C432C 457F66E2		DEC64	1019.2152
370	00076	118	2	1A75CD0A 4541DE69		DEC64	526.95033
371	0007A	122	2	4F616723 444443B		DEC64	137.15806
372	0007E	126	2	B4E0B6BC 43726386		DEC64	57.194433
373	00082	130	2	61D4306C 42054B85		DEC64	21.417501
374	00086	134	2	E1198AE8 4257B1E0		DEC64	10.938442
375	0008A	138	2	302F72B4 41C89428		DEC64	4.536174
376	0008E	142	2	DC50CE4E 413346F1		DEC64	2.614129

AD-A041 677 AIR FORCE AVIONICS LAB WRIGHT-PATTERSON AFB OHIO F/G 17/7
CONVERSION OF COMPUTER SOFTWARE FOR THE GIMBALLED ELECTROSTATIC--ETC(U)
FEB 77 W MIKULSKI, W E SHEPHARD

UNCLASSIFIED AFAL-TR-77-8-VOL-2 NL

2 OF 3
ADA041677




1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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VERSION K2040503      DECK NAME=*INIT  *                                                              PAGE  10

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                         SOURCE
            378                                   ENTRY  FENT
            379                                   ENTRY  IB
            380                                   EVEN
                                        *
                                        *    ATTITUDE (NAV) ROUTINE
                                        *
            381 00092   146  2 00000000 IB        PTR    IBM
            382 00094   148  2 5400001C           LDB    ZERO
                                        *IB1**** LDA    CD46+2                          REMOVED 26 AUG. 74
                                        ******** AFD    RES1+2                          REMOVED 26 AUG. 74
            383 00096   150  2 14000C16 IB1       LDA    RES1+2
            384 00098   152  2 FC00000C           SBF    DEG45          CD46+RES1-45 DEGREES
            385 0009A   154  2 64040000           JS     SINCOS
            386 0009C   156  2 6004               JRU    *+4
GENERATED                          0700
            387 0009E   158  2 0000003E           PTR    S1             S1=SIN(CD46+RES1-45 DEGREES)
            388 000A0   160  2 3C000030           STA    C1+2
            389 000A2   162  2 7C00002E           STB    C1             C1=COS(CD46+RES1-45 DEGREES)
                                        *
                                        *    THE FOLLOWING CODE ASSUMES CD47,CD48,CD49 AND RES2,RES3,RES4 ARE
                                        *    IN CONTIGUOUS LOCATIONS OF CORE.
                                        *
            390 000A4   164  2 5C2A000A           LDX    5,10,M
                                        *IB1A*** LDA    CD47,5                          REMOVED 26 AUG. 74
            391 000A6   166  2 16800018 IB1A      LDA    RES2,5
            392 000A8   168  2 5400001C           LDB    ZERO
                                        ******** AFD    RES2,5                          REMOVED 26 AUG. 74
            393 000AA   170  2 64040000           JS     SINCOS
            394 000AC   172  2 6004               JRU    *+4
GENERATED                          0700
            395 000AE   174  2 02800040           PTR    S2-2,5         S(K)=SIN(CD4(I)+RES(J))  K=2,3,4
            396 000B0   176  2 3E800032           STA    C2,5
            397 000B2   178  2 7E800030           STB    C2-2,5         C(K)=COS(CD4(I)+RES(J))
            398 000B4   180  2 6C2B0004           IMN    5,4,M
            399 000B6   182  2 643000A6           JGU    IB1A
            400 000B8   184  2 5C2A0008 IB2       LDX    5,FG,M
            401 000BA   186  2 1400001C           LDA    ZERO
            402 000BC   188  2 3A8A               STA    20,5           FG(3,2)=0
            403 000BD   189  2     3A8B           STA    22,5
            404 000BE   190  2 5400001C           LDB    ZERO
            405 000C0   192  2 FC000040           SBF    S1+2           S1=-S1
            406 000C2   194  2 3C0000A8           STA    TEM            TEM=-S1
            407 000C4   196  2 14000030           LDA    C1+2
            408 000C6   198  2 5400001C           LDB    ZERO
            409 000C8   200  2 3A89               STA    18,5           FG(2,2)=C1
            410 000C9   201  2     7A88           STB    16,5
            411 000CA   202  2 940000A8           MLF    TEM            -S1*C1
            412 000CC   204  2 3A8D               STA    26,5
            413 000CD   205  2     7A8C           STB    24,5           FG(1,3)=-S1*C1
            414 000CE   206  2 14000034           LDA    C2+2
            415 000D0   208  2 5400001C           LDB    ZERO
            416 000D2   210  2 3A91               STA    34,5           FG(3,3)=C2
            417 000D3   211  2     7A90           STB    32,5
            418 000D4   212  2 940000A8           MLF    TEM            -S1*C2
```

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VERSION K20A0503      DECK NAME=*INIT  *                                                          PAGE  11

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
             419 00006   214  2 3A83             STA    6,5
             420 00007   215  2       7A82       STB    4,5        FG(2,1)=-S1*C2
             421 00008   216  2 14000034         LDA    C2+2
             422 0000A   218  2 94000030         MLF    C1+2       C1*C2
             423 0000C   220  2 3A81             STA    2,5
             424 0000D   221  2       7A80       STB    0,5        FG(1,1)=C1*C2
             425 0000E   222  2 14000040         LDA    S1+2
             426 000E0   224  2 5400001C         LDB    ZERO
             427 000E2   226  2 3A87             STA    14,5       FG(1,2)=S1
             428 000E3   227  2       7A86       STB    12,5
             429 000E4   228  2 94000044         MLF    S2+2       S1*S2
             430 000E6   230  2 3A8F             STA    30,5
             431 000E7   231  2       7A8E       STB    28,5       FG(2,3)=S1*S2
             432 000E8   232  2 14000044         LDA    S2+2
             433 000EA   234  2 5400001C         LDB    ZERO
             434 000EC   236  2 3A85             STA    10,5
             435 000ED   237  2       7A84       STB    8,5        FG(3,1)=S2
             436 000EE   238  2 5C2A002C         LDX    5,LG,M
             437 000F0   240  2 14000048         LDA    S3+2
             438 000F2   242  2 3A8F             STA    30,5       LG(2,3)=S3
             439 000F3   243  2       7A8E       STB    28,5
             440 000F4   244  2 9400004C         MLF    S4+2       S3*S4
             441 000F6   246  2 3A85             STA    10,5       LG(3,1)=S3*S4
             442 000F7   247  2       7A84       STB    8,5
             443 000F8   248  2 1400001C         LDA    ZERO
             444 000FA   250  2 3A8D             STA    26,5       LG(1,3)=0
             445 000FB   251  2       3A8C       STA    24,5
             446 000FC   252  2 FC000038         SBF    C3+2       C3=-C3
             447 000FE   254  2 9400004C         MLF    S4+2       -C3*S4
             448 00100   256  2 3A83             STA    6,5
             449 00101   257  2       7A82       STB    4,5        LG(2,1)=-C3*S4
             450 00102   258  2 14000038         LDA    C3+2
             451 00104   260  2 5400001C         LDB    ZERO
             452 00106   262  2 3A91             STA    34,5       LG(3,3)=C3
             453 00107   263  2       7A90       STB    32,5
             454 00108   264  2 9400003C         MLF    C4+2       C4*C3
             455 0010A   266  2 3A89             STA    18,5
             456 0010B   267  2       7A88       STB    16,5       LG(2,2)=C4*C3
             457 0010C   268  2 1400001C         LDA    ZERO
             458 0010E   270  2 FC000048         SBF    S3+2       S3=-S3
             459 00110   272  2 9400003C         MLF    C4+2       -S3*C4
             460 00112   274  2 3A8B             STA    22,5
             461 00113   275  2       7A8A       STB    20,5       LG(3,2)=-S3*C4
             462 00114   276  2 1400003C         LDA    C4+2
             463 00116   278  2 5400001C         LDB    ZERO
             464 00118   280  2 3A81             STA    2,5        LG(1,1)=C4
             465 00119   281  2       7A80       STB    0,5
             466 0011A   282  2 1400004C         LDA    S4+2
             467 0011C   284  2 3A87             STA    14,5       LG(1,2)=S4
             468 0011D   285  2       7A86       STB    12,5
             469 0011E   286  2 64040000 I53     JS     MULS33     TM(I,J)=V1(I,J)*FG(I,J)
             470 00120   288  2 6008             JRU    *+8
GENERATED                           0700
             471 00122   290  2 00000084         PTR    V1
             472 00124   292  2 00000008         PTR    FG
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VERSION K20A0503      DECK NAME=*INIT  *                                                                  PAGE  12

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
            473 00126   294  2 0000012C             PTR    TM
            474 00128   296  2 64040000             JS     MULS33       TM1(I,J)=TM(I,J)*LG(I,J)
            475 0012A   298  2 6008                 JRU    *+8
GENERATED                            0700
            476 0012C   300  2 0000012C             PTR    TM
            477 0012E   302  2 0000002C             PTR    LG
            478 00130   304  2 00000150             PTR    TM1
            479 00132   306  2 64040000             JS     MULS33       DG(I,J)=V1(I,J)*FG(I,J)*LG(I,J)*OC(I,J)
            480 00134   308  2 6008                 JRU    *+8
GENERATED                            0700
            481 00136   310  2 00000150             PTR    TM1
            482 00138   312  2 000000C0             PTR    OC
            483 0013A   314  2 00000078             PTR    DG
            484 0013C   316  2 5C2A0078 IB4         LDX    5,DG,M
            485 0013E   318  2 5EA20020             LDX    4,32,5,M
            486 00140   320  2 128F                 LDA    30,5
            487 00141   321  2     528E             LDB    28,5
            488 00142   322  2 64040000             JS     DECATN       CPSI=ATAN(DG(2,3)/DG(3,3))
            489 00144   324  2 DC00009C             SFD    E1
            490 00146   326  2 3C000052             STA    RT1+2        RT1=CPSI-E(1,1)
            491 00148   328  2 7C000050             STB    RT1
            492 0014A   330  2 5EA20018             LDX    4,24,5,M
            493 0014C   332  2 128D                 LDA    26,5
            494 0014D   333  2     928D             MLF    26,5         DG(1,3)**2
            495 0014E   334  2 3C0000AA             STA    TEM+2
            496 00150   336  2 7C0000A8             STB    TEM
            497 00152   338  2 1400001E             LDA    FONE
            498 00154   340  2 5400001C             LDB    ZERO
            499 00156   342  2 DC0000A8             SFD    TEM          (1.0-DG(1,3)**2)
            500 00158   344  2 64040000             JS     DECSQ        SQRT(1.0-DG(1,3)**2)
            501 0015A   346  2 3C0000AA             STA    TEM+2
            502 0015C   348  2 7C0000A8             STB    TEM
            503 0015E   350  2 5C2200A8             LDX    4,TEM,M
            504 00160   352  2 128D                 LDA    26,5
            505 00161   353  2     528C             LDB    24,5
            506 00162   354  2 64040000             JS     DECATN       CTHE=ATAN(DG(1,3)/SQRT(1.0-DG(1,3)**2)
            507 00164   356  2 DC0000A0             SFD    E1+4
            508 00166   358  2 3C000056             STA    RT2+2        RT2=CTHE-E(1,2)
            509 00168   360  2 7C000054             STB    RT2
            510 0016A   362  2 5EA20000             LDX    4,0,5,M
            511 0016C   364  2 1287                 LDA    14,5
            512 0016D   365  2     5286             LDB    12,5
            513 0016E   366  2 64040000             JS     DECATN       CPHI=ATAN(DG(1,2)/DG(1,1))
            514 00170   368  2 DC0000A4             SFD    E1+8
            515 00172   370  2 3C00005A             STA    RT3+2        RT3=CPHI-E(1,3)
            516 00174   372  2 7C000058             STB    RT3
                                              *
                                              *    SET UP XR8 AND XR9 FOR DO LOOP  I=1,3. XR8 FOR DOUBLE PRECISION
                                              *    VARIABLES, XR9 FOR SINGLE PRECISION.
                                              *
            517 00176   374  2 5C420000 IB5         LDX    8,0,M
            518 00178   376  2 5C4A0000             LDX    9,0,M
            519 0017A   378  2 14400052 IB5A        LDA    RT+2,8
            520 0017C   380  2 6208                 JRG    IB5B         IS RT(I) .GE. 0
GENERATED                            0700
```

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VERSION K20A0503      DECK NAME=*INIT  *                                                                  PAGE  13

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            521 0017E    382  2 1400001C          LDA    ZERO          NO  TAKE ABS(RT(I))
            522 00180    384  2 5400001C          LDB    ZERO
            523 00182    386  2 FC400052          SBF    RT+2.8
            524 00184    388  2 FC000008 I85B     SBF    RMX
            525 00186    390  2 621E              JRG    I85D          IS ABS(RT(I)) .GE. RMX
GENERATED                          0700
            526 00188    392  2 14400052          LDA    RT+2.8        NO  (RT(I)-RTL(I))
            527 0018A    394  2 FC40005E          SBF    RTL+2.8
            528 0018C    396  2 6208              JRG    I85C          IS (RT(I)-RTL(I)) .GE. 0
GENERATED                          0700
            529 0018E    398  2 3C0000A8          STA    TEM
            530 00190    400  2 1400001C          LDA    ZERO          NO  TAKE ABS(RT(I)-RTL(I))
            531 00192    402  2 FC0000A8          SBF    TEM
            532 00194    404  2 FC00000A I85C     SBF    DRMX
            533 00196    406  2 620E              JRG    I85D          IS ABS(RT(I)-RTL(I)) .GE. DRMX
GENERATED                          0700
            534 00198    408  2 1448004E          LDA    KSN1.9
            535 0019A    410  2 E4000018          SBU    NINE
            536 0019C    412  2 6316              JRL    I85E          NO. IS KSN(I) < 9
GENERATED                          0700
            537 0019E    414  2 14000018          LDA    NINE
            538 001A0    416  2 3C48004E          STA    KSN1.9        YES. KSN(I)=9
            539 001A2    418  2 601E              JRU    I85G
                                        *
                                        *   ABS(RT(I)) .GE. RMX AND ABS(RT(I)-RTL(I)) .GE. DRMX
                                        *
GENERATED                          0700
            540 001A4    420  2 1448004E I85D     LDA    KSN1.9
            541 001A6    422  2 6114              JRN    I85F          IS KSN(I)=0
GENERATED                          0700
            542 001A8    424  2 1400001C          LDA    ZERO         YES
            543 001AA    426  2 3C4000AA          STA    E2+2.8        E2(I)=0
            544 001AC    428  2 3C4000A6          STA    E2.8
            545 001AE    430  2 3C4000B6          STA    E3+2.8        E3(I)=0
            546 001B0    432  2 3C4000B4          STA    E3.8
            547 001B2    434  2 1448004E I85E     LDA    KSN1.9
            548 001B4    436  2 A400000A          ADU    ONE           KSN(I)=KSN(I)+1
            549 001B6    438  2 3C48004E          STA    KSN1.9
            550 001B8    440  2 6008              JRU    I85G
GENERATED                          0700
            551 001BA    442  2 1448004E I85F     LDA    KSN1.9
            552 001BC    444  2 E400000A          SBU    ONE
            553 001BE    446  2 3C48004E          STA    KSN1.9        KSN(I)=KSN(I)-1
            554 001C0    448  2 1C4000A8 I85G     STX    8.TEM
            555 001C2    450  2 34000050          LAE    RT
            556 001C4    452  2 A40000A8          ADU    TEM
            557 001C6    454  2 0640              LXA    4
GENERATED                          0700
            558 001C8    456  2 1448004E          LDA    KSN1.9
            559 001CA    458  2 0842              SLL    2
            560 001CB    459  2     06A8          LXA    5
            561 001CC    460  2 1680006C          LDA    KS3+2.5
            562 001CE    462  2 9201              MLF    2.4         RT(I)*KS(KSN(I)+1.3)
GENERATED                          0700
            563 001D0    464  2 BC4000B6          ADF    E3+2.8        E3(I)=E3(I)+RT(I)*KS(KSN(I)+1.3)
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VERSION K20A0503      DECK NAME=*INIT  *                                                              PAGE  14

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
            564 001D2   466  2 3C4000B6         STA   E3+2,8
            565 001D4   468  2 7C4000B4         STB   E3,8        E3(I)=E3(I)+RT(I)*(KSN(I)+1,3)
            566 001D6   470  2 16800044         LDA   KS2+2,5
            567 001D8   472  2 9201             MLF   2,4         RT(I)*KS(KSN(I)+1,2)
GENERATED                          0700
            568 001DA   474  2 8C4000B6         ADF   E3+2,8      E3(I)+RT(I)*KS(KSN(I)+1,2)
            569 001DC   476  2 8C4000AA         ADF   E2+2,8
            570 001DE   478  2 3C4000AA         STA   E2+2,8      E2(I)=E2(I)+E3(I)+RT(I)*KS(KSN(I)+1,2)
            571 001E0   480  2 7C4000A8         STB   E2,8
            572 001E2   482  2 1680001C         LDA   KS1+2,5
            573 001E4   484  2 9201             MLF   2,4         RT(I)*KS(KSN(I)+1,1)
GENERATED                          0700
            574 001E6   486  2 8C4000AA         ADF   E2+2,8      E2(I)+RT(I)*KS(KSN(I)+1,1)
            575 001E8   488  2 8C40009E         ADF   E1+2,8
            576 001EA   490  2 3C40009E         STA   E1+2,8      E1(I)=E1(I)+E2(I)+RT(I)*KS(KSN(I)+1,1)
            577 001EC   492  2 7C40009C         STB   E1,8
            578 001EE   494  2 14400052         LDA   RT+2,8
            579 001F0   496  2 6208             JRG   IB5H
GENERATED                          0700
            580 001F2   498  2 1400001C         LDA   ZERO        NO  TAKE ABS(RT(I))
            581 001F4   500  2 5400001C         LDB   ZERO
            582 001F6   502  2 FC400052         SBF   RT+2,8
            583 001F8   504  2 3C40005E IB5H    STA   RTL+2,8
            584 001FA   506  2 7C40005C         STB   RTL,8       RTL(I)=ABS(RT(I))
            585 001FC   508  2 6C420004         IMP   8,4,M
            586 001FE   510  2 6C4A0002         IMP   9,2,M
            587 00200   512  2 244A0006         ICN   9,6,M
            588 00202   514  2 64300206         JGU   IB6
            589 00204   516  2 6430017A         JGU   IB5A
            590 00206   518  2 1400009C IB6     LDA   E1
            591 00208   520  2 5400009E         LDB   E1+2
            592 0020A   522  2 3C000068         STA   HEAD        HEAD=E(1,1)
            593 0020C   524  2 7C00006A         STB   HEAD+2
                                        *
            594 0020E   526  2 5400001C         LDB   ZERO
            595 00210   528  2 0400             CFX
            596 00211   529  2       0C01       SRAD  1           SCALE TO 2**-15
            597 00212   530  2 7C0100A3         STBH  023+1       023 DATA = E(1,1) = HEADING
            598 00214   532  2 5400001C         LDB   ZERO
            599 00216   534  2 140000A8         LDA   E2          (A) = E(1,2)
            600 00218   536  2 0400             CFX
            601 00219   537  2       0C01       SRAD  1           SCALE IT TO 2**-15
            602 0021A   538  2 7C0100A5         STBH  021+1       021 DATA = E(1,2) = PITCH
            603 0021C   540  2 5400001C         LDB   ZERO
            604 0021E   542  2 14000084         LDA   E3          (A) = E(1,3)
            605 00220   544  2 0400             CFX
            606 00221   545  2       0C01       SRAD  1
            607 00222   546  2 7C0100A7         STBH  022+1       022 DATA = E(1,3) = ROLL
                                        *
            608 00224   548  2 74000000         RTA   IBM
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VERSION K20A0503      DECK NAME=*INIT  *                                                              PAGE  15

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            610                                    EVEN
            611 00226      550  2 00000002 FENT    PTR     IOM
                                          *
                                          *           SUBROUTINE FENT (FIRST ENTRY)
                                          *
                                          *    THIS ROUTINE IS USED TO INITIALIZE ALIGNMENT AND DRIFT
                                          *    COMPUTATION UPON FIRST ENTRY AFTER SYSTEM RUN-UP. THIS ROUTINE
                                          *    CALLS ALIGN RESET (RSET) TO FULLY INITIALIZE ALIGN MODE.
                                          *
                                          *
                                          *    CLEAR MATRIX A(I,J)
                                          *
            612 00228      552  2 5C2A0022 IO1          LDX     5,34,M
            613 0022A      554  2 1400001C              LDA     ZERO
            614 0022C      556  2 3E80000C IO1A         STA     A,5
            615 0022E      558  2 6C280002              IMN     5,2,M
            616 00230      560  2 6430022C              JGU     IO1A
                                          *
                                          *    CLEAR VECTOR SDVI
                                          *
            617 00232      562  2 5C2A000A              LDX     5,10,M
            618 00234      564  2 3E8000CC IO1B         STA     SDVI,5
            619 00236      566  2 6C280002              IMN     5,2,M
            620 00238      568  2 64300234              JGU     IO1B
                                          *
                                          *    CLEAR VECTOR VAXI
                                          *
            621 0023A      570  2 5C2A000A              LDX     5,10,M
            622 0023C      572  2 3E800000 IO1C         STA     VAXI,5
            623 0023E      574  2 6C280002              IMN     5,2,M
            624 00240      576  2 6430023C              JGU     IO1C
                                          *
                                          *    CLEAR VECTOR DVXI
                                          *
            625 00242      578  2 5C2A000A              LDX     5,10,M
            626 00244      580  2 3E800000 IO1D         STA     DVXI,5
            627 00246      582  2 6C280002              IMN     5,2,M
            628 00248      584  2 64300244              JGU     IO1D
                                          *
                                          *    CLEAR VECTOR DVXG
                                          *
            629 0024A      586  2 5C2A000A              LDX     5,10,M
            630 0024C      588  2 3E800014 IO1E         STA     DVXG,5
            631 0024E      590  2 6C280002              IMN     5,2,M
            632 00250      592  2 6430024C              JGU     IO1E
                                          *
                                          *    CLEAR SRT1,SRT2,RATP,RATM
                                          *
            633 00252      594  2 3C000000              STA     SRT1
            634 00254      596  2 3C000002              STA     SRT1+2
            635 00256      598  2 3C000004              STA     SRT2
            636 00258      600  2 3C000006              STA     SRT2+2
            637 0025A      602  2 3C00000C              STA     RATP
            638 0025C      604  2 3C00000E              STA     RATP+2
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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
            639 0025E    606  2 3C000008         STA    RATM
            640 00260    608  2 3C00000A         STA    RATM+2
            641 00262    610  2 3C000012         STA    CHAJ          CHAJ=0
            642 00264    612  2 14000002         LDA    DCSK
            643 00266    614  2 3C000010         STA    DCON          RESET DCON TO -8
                                 *
                                 *    INITIALIZE MATRIX GM(I,J)
                                 *
            644 00268    616  2 5C2A0060 I02     LDX    5,GM,M
            645 0026A    618  2 14000086         LDA    CD19+2
            646 0026C    620  2 54000084         LDB    CD19
            647 0026E    622  2 3A81             STA    2,5           GM(1,1)= CD19
            648 0026F    623  2      7A80        STB    0,5
            649 00270    624  2 1400001C         LDA    ZERO
            650 00272    626  2 5400001C         LDB    ZERO
            651 00274    628  2 DC00009C         SFD    CD25
            652 00276    630  2 3AB3             STA    6,5           GM(2,1) = -CD25
            653 00277    631  2      7AB2        STB    4,5
            654 00279    632  2 1400009C         LDA    CD22+2
            655 0027A    634  2 54000098         LDB    CD22
            656 0027C    636  2 3AB5             STA    10,5          GM(3,1)= CD22
            657 0027D    637  2      7AB4        STB    8,5
            658 0027E    638  2 1400008A         LDA    CD20+2
            659 00280    640  2 54000088         LDB    CD20
            660 00282    642  2 3AB7             STA    14,5          GM(1,2)= CD20
            661 00283    643  2      7AB6        STB    12,5
            662 00284    644  2 1400001C         LDA    ZERO
            663 00286    646  2 5400001C         LDB    ZERO
            664 00288    648  2 DC0000A0         SFD    CD26
            665 0028A    650  2 3AB9             STA    18,5          GM(2,2)=-CD26
            666 0028B    651  2      7AB8        STB    16,5
            667 0028C    652  2 14000096         LDA    CD23+2
            668 0028E    654  2 54000094         LDB    CD23
            669 00290    656  2 3ABB             STA    22,5          GM(3,2)= CD23
            670 00291    657  2      7ABA        STB    20,5
            671 00292    658  2 1400008E         LDA    CD21+2
            672 00294    660  2 5400008C         LDB    CD21
            673 00296    662  2 3ABD             STA    26,5          GM(1,3)= CD21
            674 00297    663  2      7ABC        STB    24,5
            675 00298    664  2 1400001C         LDA    ZERO
            676 0029A    666  2 5400001C         LDB    ZERO
            677 0029C    668  2 DC0000A4         SFD    CD27
            678 0029E    670  2 3ABF             STA    30,5          GM(2,3)=-CD27
            679 0029F    671  2      7ABE        STB    28,5
            680 002A0    672  2 1400009A         LDA    CD24+2
            681 002A2    674  2 54000098         LDB    CD24
            682 002A4    676  2 3AC1             STA    34,5          GM(3,3)= CD24
            683 002A5    677  2      7AC0        STB    32,5
                                 *
                                 *    INITIALIZE MATRIX A(I,I)  VALUES ON DIAGONAL
                                 *
            684 002A6    678  2 5C2A000C         LDX    5,A,M
            685 002A8    680  2 1400003E         LDA    CD01+2
            686 002AA    682  2 5400003C         LDB    CD01
            687 002AC    684  2 3A81             STA    2,5           A(1,1)= CD01
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            688 002AD    685  2     7A80          STB    0,5
            689 002AE    686  2 14000042          LDA    CD02+2
            690 002B0    688  2 54000040          LDB    CD02
            691 002B2    690  2     3A89          STA    18,5          A(2,2)= CD02
            692 002B3    691  2     7A88          STB    16,5
            693 002B4    692  2 14000046          LDA    CD03+2
            694 002B6    694  2 54000044          LDB    CD03
            695 002B8    696  2     3A91          STA    34,5          A(3,3)= CD03
            696 002B9    697  2     7A90          STB    32,5
                                              *
                                              *
            697 002BA    698  2 64040000          JS     MUL33         AB(I,J)=TM(I,J)*A(I,J)
            698 002BC    700  2 6008              JRU    *+8
GENERATED                          0700
            699 002BE    702  2 00000054          PTR    CD07
            700 002C0    704  2 0000000C          PTR    A
            701 002C2    706  2 0000003C          PTR    AB
            702 002C4    708  2 14000116 I03      LDA    LATL+2
            703 002C6    710  2 54000114          LDB    LATL
            704 002C8    712  2 3C00000A          STA    LAT+2         INITIALIZE LAT TO LATL
            705 002CA    714  2 7C000008          STB    LAT
                                              *
            706 002CC    716  2 64040000          JS     SINCOS        SGDL=SIN(LAT)
            707 002CE    718  2 6004              JRU    *+4           CGDL=COS(LAT)
GENERATED                          0700
            708 002D0    720  2 00000008          PTR    SGDL
            709 002D2    722  2 3C00000E          STA    CGDL+2
            710 002D4    724  2 7C00000C          STB    CGDL
                                              *
            711 002D6    726  2 5C22011C          LDX    4,GL,M
            712 002D8    728  2 64040000          JS     MULFD         AK1T=CGDL*GL
            713 002DA    730  2 3C00000E          STA    AK1T+2
            714 002DC    732  2 7C00000C          STB    AK1T
            715 002DE    734  2 1400000A          LDA    SGDL+2
            716 002E0    736  2 54000008          LDB    SGDL
            717 002E2    738  2 64040000          JS     MULFD         AK2T=SGDL*GL
            718 002E4    740  2 3C000012          STA    AK2T+2
            719 002E6    742  2 7C000010          STB    AK2T
            720 002E8    744  2 1400001C I04      LDA    ZERO
            721 002EA    746  2 3C000014          STA    PHA           PHA=0
            722 002EC    748  2 3C000016          STA    PHA+2
                                              *
                                              *     CLEAR VC(I)X AND VF(I)X   I=1,3
                                              *
            723 002EE    750  2 5C2A0046          LDX    5,70,M
            724 002F0    752  2 3E800066 I04A     STA    VC1X,5
            725 002F2    754  2 6C280002          IMN    5,2,M
            726 002F4    756  2 643002F0          JGU    I04A
            727 002F6    758  2 5C2A0022          LDX    5,34,M
            728 002F8    760  2 3E9000F2 I04B     STA    AJ,5          AJ(I,J)=0
            729 002FA    762  2 6C280002          IMN    5,2,M
            730 002FC    764  2 643002F8          JGU    I04B
            731 002FE    766  2 5C2A00F2          LDX    5,AJ,M
            732 00300    768  2 1400001E          LDA    FONE
            733 00302    770  2 3A81              STA    2,5           AJ(1,1)=AJ(2,2)=AJ(3,3)=1.0
```

VERSION K2040503 DECK NAME=*INIT *

DIAGNOSTICS	LINE	ADRES	DADRES	LC	PROGRAM				SOURCE
	734	00303	771	2	3A89		STA	18,5	
	735	00304	772	2	3A91		STA	34,5	
GENERATED					0700				
	736	00306	774	2	1400005A		LDA	TIME+2	
	737	00308	776	2	54000058		LDB	TIME	
	738	0030A	778	2	3C00005E		STA	T0+2	
	739	0030C	780	2	7C00005C		STB	T0	T0=TIME
	740	0030E	782	2	5C220012		LDX	4,DFB,M	
	741	00310	784	2	1400011E		LDA	GL+2	
	742	00312	786	2	5400011C		LDB	GL	
	743	00314	788	2	64040000		JS	MULFD	
	744	00316	790	2	3C000060		STA	VTB+2	VTB=GL*8.0
	745	00318	792	2	7C00005E		STB	VTB	
	746	0031A	794	2	5C220030		LDX	4,DELT,M	
	747	0031C	796	2	1400011E		LDA	GL+2	
	748	0031E	798	2	5400011C		LDB	GL	
	749	00320	800	2	64040000		JS	MULFD	
	750	00322	802	2	3C000064		STA	VTC+2	VTC=GL*DELT
	751	00324	804	2	7C000062		STB	VTC	
	752	00326	806	2	5C2A000A		LDX	5,10,M	
	753	00328	808	2	16800048	I04C	LDA	CD04,5	
	754	0032A	810	2	56800046		LDB	CD04-2,5	
	755	0032C	812	2	64040000		JS	MULFD	
	756	0032E	814	2	3E800038		STA	CD040,5	CD0(I)D=CD0(I)*DELT I=4,6
	757	00330	816	2	7E800036		STB	CD04D-2,5	
	758	00332	818	2	6C280004		IMN	5,4,M	
	759	00334	820	2	64300328		JGU	I04C	
	760	00336	822	2	14000008		LDA	NONE	
	761	00338	824	2	3C00002C		STA	NMO	NMO=-1
						*			
						*			
	762	0033A	826	2	64040470		JS	RSET	
						*			
						*			
	763	0033C	828	2	14000102	I05	LDA	CD50+2	
	764	0033E	830	2	54000100		LDB	CD50	
						*			
						*			
	765	00340	832	2	64040000		JS	SINCOS	TEM=SIN(CD50)
	766	00342	834	2	6004		JRU	*+4	TEM0=COS(CD50)
GENERATED					0700				
	767	00344	836	2	000000A8		PTR	TEM	
	768	00346	838	2	3C0000B6		STA	TEM0+2	
	769	00348	840	2	7C0000B4		STB	TEM0	
						*			
						*			
	770	0034A	842	2	14000106		LDA	CD51+2	
	771	0034C	844	2	54000104		LDB	CD51	
						*			
	772	0034E	846	2	64040000		JS	SINCOS	TEM1=SIN(CD51)
	773	00350	848	2	6004		JRU	*+4	TEM2=COS(CD51)
GENERATED					0700				
	774	00352	850	2	000000B8		PTR	TEM1	
	775	00354	852	2	3C0000BE		STA	TEM2+2	
	776	00356	854	2	7C0000BC		STB	TEM2	

```
VERSION K20A0503      DECK NAME=*INIT  *

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
                                          *
                                          *
                                          *    INITIALIZE MATRIX OC(I,J)
                                          *
        777 00358    856  2 5C2A00C0          LDX    5,OC,M
        778 0035A    858  2 5C22008C          LDX    4,TEM2,M
        779 0035C    860  2 3A81              STA    2,5
        780 0035D    861  2        7A80       STB    0,5          OC(1,1)=COS(CD51)
        781 0035E    862  2 14000086          LDA    TEM0+2
        782 00360    864  2 54000084          LDB    TEM0
        783 00362    866  2 3A89              STA    18,5         OC(2,2)=COS(CD50)
        784 00363    867  2        7A88       STB    16,5
        785 00364    868  2 64040000          JS     MULFD        COS(CD51)*COS(CD50)
        786 00366    870  2 3A91              STA    34,5         OC(3,3)=COS(CD51)*COS(CD50)
        787 00367    871  2        7A90       STB    32,5
        788 00368    872  2 140000AA          LDA    TEM+2
        789 0036A    874  2 540000A8          LDB    TEM
        790 0036C    876  2 64040000          JS     MULFD        COS(CD51)*SIN(CD50)
        791 0036E    878  2 3A8B              STA    22,5
        792 0036F    879  2        7A8A       STB    20,5         OC(3,2)=COS(CD51)*SIN(CD50)
        793 00370    880  2 1400001C          LDA    ZERO
        794 00372    882  2 5400001C          LDB    ZERO
        795 00374    884  2 3A83              STA    6,5          OC(2,1)=0
        796 00375    885  2        7A82       STB    4,5
        797 00376    886  2 DC0000A8          SFD    TEM          0-SIN(CD50)=-SIN(CD50)
        798 00378    888  2 3A8F              STA    30,5
        799 00379    889  2        7A8E       STB    28,5         OC(2,3)= -SIN(CD50)
        800 0037A    890  2 140000BA          LDA    TEM1+2
        801 0037C    892  2 540000B8          LDB    TEM1
        802 0037E    894  2 3A85              STA    10,5         OC(3,1)= SIN(CD51)
        803 0037F    895  2        7A84       STB    8,5
        804 00380    896  2 1400001C          LDA    ZERO
        805 00382    898  2 5400001C          LDB    ZERO
        806 00384    900  2 DC0000B8          SFD    TEM1         0-SIN(CD51)= -SIN(CD51)
        807 00386    902  2 3C0000BA          STA    TEM1+2
        808 00388    904  2 7C0000B8          STB    TEM1
        809 0038A    906  2 5C2200B8          LDX    4,TEM1,M
        810 0038C    908  2 140000AA          LDA    TEM+2
        811 0038E    910  2 540000A8          LDB    TEM
        812 00390    912  2 64040000          JS     MULFD        -SIN(CD51)*SIN(CD50)
        813 00392    914  2 3A87              STA    14,5
        814 00393    915  2        7A86       STB    12,5         OC(1,2)= -SIN(CD51)*SIN(CD50)
        815 00394    916  2 14000086          LDA    TEM0+2
        816 00396    918  2 54000084          LDB    TEM0
        817 00398    920  2 64040000          JS     MULFD        -SIN(CD51)*COS(CD50)
        818 0039A    922  2 3A8D              STA    26,5
        819 0039B    923  2        7A8C       STB    24,5         OC(1,3)= -SIN(CD51)*COS(CD50)
                                          *
                                          *    CLEAR MATRIX E(I,J)
                                          *
        820 0039C    924  2 5C2A0022          LDX    5,34,M
        821 0039E    926  2 1400001C          LDA    ZERO
        822 003A0    928  2 3E80009C  IO5A    STA    E1,5
        823 003A2    930  2 6C280002          IMN    5,2,M
        824 003A4    932  2 643003A0          JGU    IO5A
```

VERSION K20A0503 DECK NAME=*INIT *


```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
                                        *
                                        *   CLEAR KSN1,KSN2,KSN3
                                        *
             825 003A6    934  2 3C00004E        STA    KSN1
             826 003A8    936  2 3C000050        STA    KSN2
             827 003AA    938  2 3C000052        STA    KSN3
             828 003AC    940  2 14000004        LDA    NFOUR
             829 003AE    942  2 3C000036        STA    ASCH        ASCH=-4. SETS ALIGN SCHEDULER FOR
                                        *                           1/3 SECOND ACCUMULATION OF DELTA V
                                        *
             830 003B0    944  2 14000018        LDA    JALN
             831 003B2    946  2 3C00017A        STA    VECT+6      ENTRY 4 OF VECT = CALL TO ALIGN
                                        *
                                        *   BSIG= DUMMY
                                        *
             832 003B4    948  2 5C2A0078        LDX    5,DG,M
             833 003B6    950  2 1400001C        LDA    ZERO
             834 003B8    952  2 3A86            STA    12,5        DG(1,2)=0
             835 003B9    953  2      3A87       STA    14,5
             836 003BA    954  2 3A84            STA    8,5         DG(3,1)=0
             837 003BB    955  2      3A85       STA    10,5
             838 003BC    956  2 1400006A        LDA    HEAD+2
             839 003BE    958  2 54000068        LDB    HEAD
             840 003C0    960  2 64040000        JS     SINCOS
             841 003C2    962  2 6004            JRU    *+4
GENERATED                            0700
             842 003C4    964  2 02800014        PTR    20,5        DG(3,2)=SIN(HEAD)
             843 003C6    966  2 1400001C        LDA    ZERO
             844 003C8    968  2 5400001C        LDB    ZERO
             845 003CA    970  2 DA8A            SFD    20,5        DG(3,2)=-SIN(HEAD)
             846 003CB    971  2      3A88       STA    22,5
             847 003CC    972  2 7A8A            STB    20,5
GENERATED                            0700
             848 003CE    974  2 1400001E        LDA    FONE
             849 003D0    976  2 5400001C        LDB    ZERO
             850 003D2    978  2 3A81            STA    2,5         DG(1,1)=1.0
             851 003D3    979  2      7A80       STB    0,5
             852 003D4    980  2 74000002        RTA    IOM
```

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VERSION K2040503      DECK NAME=*INIT  *                                                              PAGE  21
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
                                            *
                                            *    SUBROUTINE NAVI
                                            *    NAVIGATION INITIALIZATION
                                            *
           854                                       ENTRY   NAVI
           855                                       EVEN
           856 003D6    982  2 00000006 NAVI         PTR     IISM
           857 003D8    984  2 14000016              LDA     JNAV
           858 003DA    986  2 3C00017A              STA     VECT+6       ENTRY 4 OF VECT = CALL TO NAV
           859 003DC    988  2 1400000A              LDA     ONE
           860 003DE    990  2 3C000064              STA     NAVF         SET NAV FLAG FOR NAVIGATION
           861 003E0    992  2 5C22000C              LDX     4,CGDL,M
           862 003E2    994  2 1400002E              LDA     KGDL+2
           863 003E4    996  2 5400002C              LDB     KGDL
           864 003E6    998  2 64040000              JS      MULFD        (CGDL*KGDL)
           865 003E8   1000  2 3C000086              STA     TEMO+2
           866 003EA   1002  2 7C000084              STB     TEMO         TEMO=(CGDL*KGDL)
           867 003EC   1004  2 5C220084              LDX     4,TEMO,M
           868 003EE   1006  2 1400000A              LDA     SGDL+2
           869 003F0   1008  2 54000008              LDB     SGDL
           870 003F2   1010  2 64040000              JS      DECATN       TEMO=ATAN(SGDL/(CGDL*KGDL))
           871 003F4   1012  2 64040000              JS      SINCOS
           872 003F6   1014  2 6004                  JRU     *+4          SGCL=SIN(TEMO)
GENERATED                         0700
           873 003F8   1016  2 00000034              PTR     SGCL         CGCL=COS(TEMO)
           874 003FA   1018  2 3C00003A              STA     CGCL+2
           875 003FC   1020  2 7C000038              STB     CGCL
           876 003FE   1022  2 5C220038              LDX     4,CGCL,M
           877 00400   1024  2 64040000              JS      MULFD        C2GC=CGCL**2
           878 00402   1026  2 3C000032              STA     C2GC+2
           879 00404   1028  2 7C000030              STB     C2GC
           880 00406   1030  2 5C220034              LDX     4,SGCL,M
           881 00408   1032  2 14000036              LDA     SGCL+2
           882 0040A   1034  2 54000034              LDB     SGCL
           883 0040C   1036  2 64040000              JS      MULFD        S2GC=SGCL**2
           884 0040E   1038  2 3C00002E              STA     S2GC+2
           885 00410   1040  2 7C00002C              STB     S2GC
                                            *
                                            *
           886 00412   1042  2 64040000              JS      IF2          COMPUTE DELR AND RAD
                                            *
                                            *
           887 00414   1044  2 5C220000              LDX     4,RAD,M
           888 00416   1046  2 1400003A              LDA     CGCL+2
           889 00418   1048  2 54000038              LDB     CGCL
           890 0041A   1050  2 64040000              JS      MULFD        X=RAD*CGCL
           891 0041C   1052  2 3C0000C2              STA     X+2
           892 0041E   1054  2 7C0000C0              STB     X
           893 00420   1056  2 14000036              LDA     SGCL+2
           894 00422   1058  2 54000034              LDB     SGCL
           895 00424   1060  2 64040000              JS      MULFD        Z=RAD*SGCL
           896 00426   1062  2 3C0000CA              STA     Z+2
           897 00428   1064  2 7C0000C8              STB     Z
           898 0042A   1066  2 1400001C              LDA     ZERO
```

VERSION K20A0503 DECK NAME=*INIT *

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM			SOURCE
899	0042C	1068	2	3C0000C6	STA	Y+2	Y=0
900	0042E	1070	2	3C0000C4	STA	Y	
901	00430	1072	2	3C000026	STA	LATB+2	LATB=0
902	00432	1074	2	3C000024	STA	LATB	
903	00434	1076	2	3C000022	STA	LONB+2	LONB=0
904	00436	1078	2	3C000020	STA	LONB	
905	00438	1080	2	3C000016	STA	VX+2	VX=0
906	0043A	1082	2	3C000014	STA	VX	
907	0043C	1084	2	3C00001E	STA	VZ+2	VZ=0
908	0043E	1086	2	3C00001C	STA	VZ	
909	00440	1088	2	5C220024	LDX	4,OMGA,M	
910	00442	1090	2	140000C2	LDA	X+2	
911	00444	1092	2	540000C0	LDB	X	
912	00446	1094	2	64040000	JS	MULFD	X*OMGA
913	00448	1096	2	3C00001A	STA	VY+2	
914	0044A	1098	2	7C000018	STB	VY	VY=OMGA*X
915	0044C	1100	2	14000002	LDA	RAD+2	
916	0044E	1102	2	54000000	LDB	RAD	
917	00450	1104	2	3C000006	STA	RXYZ+2	RXYZ=RAD
918	00452	1106	2	7C000004	STB	RXYZ	
919	00454	1108	2	1400011A	LDA	LONL+2	
920	00456	1110	2	54000118	LDB	LONL	
921	00458	1112	2	3C00000E	STA	LONG+2	
922	0045A	1114	2	7C00000C	STB	LONG	LONG=LONL
923	0045C	1116	2	3C00002A	STA	LGO+2	
924	0045E	1118	2	7C000028	STB	LGO	LGO=LONL
925	00460	1120	2	1400005A	LDA	TIME+2	
926	00462	1122	2	54000058	LDB	TIME	
927	00464	1124	2	0C000038	SFD	D3032	TIME=TIME-3/32
928	00466	1126	2	3C00005E	STA	T0+2	
929	00468	1128	2	7C00005C	STB	T0	
930	0046A	1130	2	3C0000DA	STA	TLP0+2	TLP0=T0
931	0046C	1132	2	7C0000D8	STB	TLP0	
932	0046E	1134	2	74000006	RTA	IISM	

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VERSION K20A0503      DECK NAME=*INIT  *                                                                    PAGE  23

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
            934                                      EVEN
            935                                      ENTRY   RSET
                                             *
                                             *          SUBROUTINE RSET (ALIGNMENT RESET)
                                             *
                                             *     THIS ROUTINE SELECTS THE SOLUTION TIME AND MODE FOR THE
                                             *     ALIGNMENT.
                                             *
                                             *
            936 00470   1136  2 00000004 RSET       PTR    IIQM
            937 00472   1138  2 1400001C IIQ1       LDA    ZERO
            938 00474   1140  2 3C000024            STA    SRA
            939 00476   1142  2 3C000026            STA    SRA+2             SRA=0
            940 00478   1144  2 5C2A000A            LDX    5,10,M
            941 0047A   1146  2 3E800018 IIQ1A      STA    VAX,5             CLEAR VAX,VAY,&VAZ
            942 0047C   1148  2 6C2B0002            IMN    5,2,M
            943 0047E   1150  2 6430047A            JGU    IIQ1A
                                             *
                                             *     CLEAR YA1,YA2,YB1,YB2,YC1,YC2,XA1,XA2,XB1,XB2,XC1,XC2.
                                             *     NOTE: THESE LOCATIONS ARE CONSIDERED TO BE IN CONTIGUOUS
                                             *     LOCATIONS OF CORE
                                             *
            944 00480   1152  2 5C2A002E            LDX    5,46,M
            945 00482   1154  2 3E80002E IIQ1B      STA    XA,5
            946 00484   1156  2 6C2B0002            IMN    5,2,M
            947 00486   1158  2 64300482            JGU    IIQ1B
            948 00488   1160  2 5C28002C IIQ2       LDX    5,NMO
            949 0048A   1162  2 6C2A0001            IMP    5,1,M
            950 0048C   1164  2 1C28002C            STX    5,NMO             NMO=NMO+1
            951 0048E   1166  2 242A0000            ICN    5,0,M             CHECK FOR NMO=0
            952 00490   1168  2 643004EC            JGU    IIQ2A
            953 00492   1170  2 24280004            ICL    5,4,M             CHECK FOR NMO.GE.1 OR .LE.3
            954 00494   1172  2 643004A0            JGU    IIQ2B
            955 00496   1174  2 14000000            LDA    N64
            956 00498   1176  2 3C000024            STA    NCCD              NCCD=-64
            957 0049A   1178  2 1400000A            LDA    ONE
            958 0049C   1180  2 3C000026            STA    SAMI              SAMI=1
            959 0049E   1182  2 605C                JRU    IIQ3A
GENERATED                              0700
            960 004A0   1184  2 24280007 IIQ2B      ICL    5,7,M             CHECK FOR NMO.GE.4 OR .LE.6
            961 004A2   1186  2 643004C0            JGU    IIQ2C
                                             ********************
                                             *
                                             *     SET UP COARSE SOLUTION SCALING SHIFTS
                                             *
                                             ********************
            962 004A4   1188  2 1400000A            LDA    LAT+2
            963 004A6   1190  2 54000008            LDB    LAT
            964 004A8   1192  2 DC00000E            SFD    DEG49
            965 004AA   1194  2 620C                JRG    IIQ2B1
GENERATED                              0700
            966 004AC   1196  2 14000006            LDA    N1200
            967 004AE   1198  2 3C000024            STA    NCCD              NCCD=-1200
            968 004B0   1200  2 1400001C            LDA    ZERO
```

```
VERSION K20A0503       DECK NAME=*INIT  *                                                                         PAGE  24

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
            969 004B2   1202  2 3C000028            STA     MCSI          MCSI=0
            970 004B4   1204  2 6042                JRU     II03
GENERATED                          0700
            971 004B6   1206  2 14000004 II02B1     LDA     N1680
            972 004B8   1208  2 3C000024            STA     NCCD          NCCD=-1680
            973 004BA   1210  2 1400000A            LDA     ONE
            974 004BC   1212  2 3C000028            STA     MCSI          MCSI=1
            975 004BE   1214  2 6038                JRU     II03
GENERATED                          0700
            976 004C0   1216  2 242A0007 II02C      ICN     5,7,M         CHECK FOR NMO=7
            977 004C2   1218  2 643004D2            JGU      II02D
            978 004C4   1220  2 1400001C            LDA     ZERO
            979 004C6   1222  2 3C000030            STA     FLGN          FLGN=0
                                         *******************
                                         *
                                         *    I.N.S. NOT ALIGN LIGHT OFF
                                         *
                                         ******************
            980 004C8   1224  2 1400005A            LDA     TIME+2
            981 004CA   1226  2 5400005B            LDB     TIME
            982 004CC   1228  2 9C000034            AFD     D1032         SAVT=TIME+1/32
            983 004CE   1230  2 3C000034            STA     SAVT+2
            984 004D0   1232  2 7C000032            STB     SAVT
            985 004D2   1234  2          II02D      EQU     *
                                         *******************
                                         *
                                         *    SET UP FINE SOLUTION SCALING SHIFTS...  FIDDLE WITH BITE BITS
                                         *    FOR IMU,VAC,ROT,AND UNR
                                         *
                                         *******************
            986 004D2   1234  2 1400000C            LDA     FASI
            987 004D4   1236  2 E400000E            SBU     THREE
            988 004D6   1238  2 610C                JRN     II02D1
GENERATED                          0700
            989 004D8   1240  2 1400000E            LDA     THREE
            990 004DA   1242  2 3C000028            STA     MCSI          MCSI=3
            991 004DC   1244  2 14000000            LDA     N7200
            992 004DE   1246  2 3C000024            STA     NCCD          NCCD=-7200
            993 004E0   1248  2 6016                JU      II03
GENERATED                          0700
            994 004E2   1250  2 1400000C II02D1     LDA     TWO
            995 004E4   1252  2 3C000028            STA     MCSI          MCSI=2
            996 004E6   1254  2 14000002            LDA     N4800
            997 004E8   1256  2 3C000024            STA     NCCD          NCCD=-4800
            998 004EA   1258  2 600C                JRU     II03
GENERATED                          0700
            999 004EC   1260  2 14000002 II02A      LDA     DCSK
           1000 004EE   1262  2 3C000024            STA     NCCD          NCCD=-8
           1001 004F0   1264  2 1400001C            LDA     ZERO
           1002 004F2   1266  2 3C000026            STA     SAMI          SAMI=0
           1003 004F4   1268  2 6006                JRU     II03A
GENERATED                          0700
           1004 004F6   1270  2 1400000C II03       LDA     TWO
           1005 004F8   1272  2 3C000026            STA     SAMI          SAMI=2
           1006 004FA   1274  2 1400001C II03A      LDA     ZERO
```

VERSION K20A0503 DECK NAME=*INIT *


```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            1007 004FC   1276  2 3C00002A        STA    NCCU       NCCU=0
            1008 004FE   1278  2 3C00002C        STA    NCCU+2
            1009 00500   1280  2 74000004        RTA    IIQM
            1010                                 END
```

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                STATISTICS

TOTAL SHORTS   138
TOTAL LONGS    484
TOTAL INSTRUCTIONS   622
PERCENT SHORT   22.2
GENERATED NOPS   34
THEORETICAL PERCENT NOP LOADING   10.1
ACTUAL PERCENT NOP LOADING    3.0
```

```
    DECK NAME=*INIT  *                      *****ERROR MESSAGES*****

 LINE NUMBER                          DIAGNOSTIC
1    226.............................ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
2    345.............................ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
```

XREF 1 DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 1

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES			
0000C	12		5	A	112	113	614	684	700
0003C	60		6	AB	136	701			
000F2	242		4	AJ	107	728	731		
0000C	12		8	AK1T	152	713	714		
00010	16		8	AK2T	153	718	719		
00010	16		7	ALT	185				
00150	336		7	AP	214				
00036	54		5	ASCH	116	117	829		
0015C	348		7	AT	215				
00030	48		4	BTE1	15				
00032	50		4	BTE3	16				
0003C	60		9	CD01	252	685	686		
00040	64		9	CD02	253	689	690		
00044	68		9	CD03	254	693	694		
00038	56		5	CD040	118	756	757		
00048	72		9	CD04	255	753	754		
0004C	76		9	CD05	256				
00050	80		9	CD06	257				
00054	84		9	CD07	258	699			
00058	88		9	CD08	259				
0005C	92		9	CD09	260				
00060	96		9	CD10	261				
00064	100		9	CD11	262				
00068	104		9	CD12	263				
0006C	108		9	CD13	264				
00070	112		9	CD14	265				
00074	116		9	CD15	267				
00078	120		9	CD16	268				
0007C	124		9	CD17	269				
00080	128		9	CD18	270				
00084	132		9	CD19	271	645	646		
00088	136		9	CD20	272	658	659		
0008C	140		9	CD21	273	671	672		
00090	144		9	CD22	274	654	655		
00094	148		9	CD23	275	667	668		
00098	152		9	CD24	276	680	681		
0009C	156		9	CD25	277	651			
000A0	160		9	CD26	278	664			
000A4	164		9	CD27	279	677			
000A8	168		9	CD28	280				
000AC	172		9	CD29	281				
000B0	176		9	CD30	282				
000B4	180		9	CD31	283				
000B8	184		9	CD32	284				
000BC	188		9	CD33	285				
000C0	192		9	CD34	286				
000C4	196		9	CD35	287				
000C8	200		9	CD36	288				
000CC	204		9	CD37	289				
000D0	208		9	CD38	290				
000D4	212		9	CD39	291				
000D8	216		9	CD40	293				
000DC	220		9	CD41	294				

XREF 1 DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 2

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES				
000E0	224		9	CD42	295					
000E4	228		9	CD43	296					
000E8	232		9	CD44	297					
000EC	236		9	CD45	298					
000F0	240		9	CD46	299					
000F4	244		9	CD47	300					
000F8	248		9	CD48	301					
000FC	252		9	CD49	302					
00100	256		9	CD50	303	763	764			
00104	260		9	CD51	304	770	771			
00108	264		9	CD52	305					
0010C	268		9	CD53	306					
00110	272		9	CD54	307					
00114	276		9	CD55	309					
00118	280		9	CD56	311					
0011C	284		9	CD57	313					
00120	288		9	CD58	314					
00124	292		9	CD59	315					
00128	296		9	CD60	316					
0012C	300		9	CD61	317					
00130	304		9	CD62	318					
00134	308		9	CD63	319					
00138	312		9	CD64	320					
00038	56		6	CGCL	135	874	875	876	888	889
0000C	12		7	CGUL	184	222	709	710	861	
00012	18		6	CMAJ	125	641				
00038	56		4	CIPM	19					
0000C	12		7	CL	222					
00000	0		9	CONCOM	223					
00052	82		4	CTR1	29					
00054	84		4	CTR2	30					
00056	86		4	CTR3	31					
00004	4		7	CWT	182					
0004A	74		4	CYLE	25					
0002E	46		7	C1	192	388	389	407	422	
00032	50		7	C2	193	396	397	414	421	
00030	48		6	C2GC	133	878	879			
00036	54		7	C3	194	446	450			
0003A	58		7	C4	195	454	459	462		
000E4	228		7	D	209	216				
00066	102		4	DATA	37					
0000C	12		5	DCAR	113					
00010	16		6	DCON	124	643				
00002	2		9	DCSK	226	642	999			
*****UNDEFINED*****				DECATN		488	506	513	870	
*****UNDEFINED*****				DECSW		500				
0000C	12		2	DEG45	342	384				
0000E	14		2	DEG49	343	964				
00030	48		9	DELT	248	746				
0001C	28		9	DFONE	242					
00012	18		2	DF8	344	740				
00078	120		7	DG	204	483	484	832		
00024	36		4	DPDV	12					

XREF 1 DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 3

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES								
00028	40	4		DPHV	13									
00020	32	4		DPVV	11									
0004E	78	4		DRFV	27									
0000A	10	2		DRMX	341	532								
0003E	62	4		DVX	22									
00014	20	4		DVXG	8	630								
00000	0	5		DVXI	109	626								
00042	66	4		DVY	23									
00018	24	4		DVYG	9									
00004	4	5		DVYJ	110									
00046	70	4		DVZ	24									
0001C	28	4		DVZG	10									
00008	8	5		DVZK	111									
00054	84	7		D1	203	218								
00034	52	9		D1032	249	982								
00038	56	9		D3032	250	927								
00016	22	9		EIGHT	237									
0009C	156	7		E1	205	489	507	514	575	576	577	590	591	822
000A8	168	7		E2	206	543	544	569	570	571	574	599		
00084	180	7		E3	207	545	546	563	564	565	568	604		
0000C	12	9		FASI	232	986								
00226	550	2		FENT	611	378								
00008	8	1		FG	327	400	472							
00030	48	5		FLGN	114	979								
0001E	30	9		FONE	241	497	732	848						
00010	16	9		FOUR	234									
0011C	284	9		GL	312	313	711	741	742	747	748			
00060	96	6		GM	137	644								
0002C	44	4		GMT	14									
00050	80	4		HDGV	28									
00068	104	1		HEAD	334	592	593	838	839					
*****UNDEFINED*****				IA		345								
00000	0	8		IACOM	150									
00092	146	2		IB	381	379								
00000	0	1		IBM	323	381	608							
00096	150	2		IB1	383									
000A6	166	2		IB1A	391	399								
00088	184	2		IB2	400									
0011E	285	2		IB3	469									
0013C	316	2		IB4	484									
00176	374	2		IB5	517									
0017A	378	2		IB5A	519	589								
00184	388	2		IB5B	524	520								
00194	404	2		IB5C	532	528								
001A4	420	2		IB5D	540	525	533							
00182	434	2		IB5E	547	536								
0018A	442	2		IB5F	551	541								
001C0	448	2		IB5G	554	539	550							
001F8	504	2		IB5H	583	579								
00206	518	2		IB6	590	588								
*****UNDEFINED*****				IF2		886								
*****UNDEFINED*****				IIA		346								
00004	4	1		IIQM	325	936	1009							

XREF] DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 4

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES							
0047A	1146		2	IIQ1A	941	943							
00482	1154		2	IIQ1B	945	947							
00472	1138		2	IIQ1	937								
004EC	1260		2	IIQ2A	999	952							
004A0	1184		2	IIQ2B	960	954							
004B6	1206		2	IIQ2B1	971	965							
004C0	1216		2	IIQ2C	976	961							
004D2	1234		2	IIQ2D	985	977							
004E2	1250		2	IIQ2D1	994	988							
00488	1160		2	IIQ2	948								
004FA	1274		2	IIQ3A	1006	959	1003						
004F6	1270		2	IIQ3	1004	970	975	993	998				
00006	6		1	IISM	326	856	932						
00002	2		1	IOM	324	611	852						
00228	552		2	IO1	612								
0022C	556		2	IO1A	614	616							
00234	564		2	IO1B	618	620							
0023C	572		2	IO1C	622	624							
00244	580		2	IO1D	626	628							
0024C	588		2	IO1E	630	632							
00268	616		2	IO2	644								
002C4	708		2	IO3	702								
002E8	744		2	IO4	720								
002F0	752		2	IO4A	724	726							
002F8	760		2	IO4B	728	730							
00328	808		2	IO4C	753	759							
0033C	828		2	IO5	763								
003A0	928		2	IO5A	822	824							
00060	96		4	ITER	34								
00018	24		2	JALN	346	830							
00016	22		2	JNAV	345	857							
000E4	228		7	J3X3	216								
0002C	44		9	KGDL	247	862	863						
0004E	78		7	KSN1	200	534	538	540	547	549	551	553	558	825
00050	80		7	KSN2	201	826							
00052	82		7	KSN3	202	827							
0001A	26		2	KS1	347	572							
00042	66		2	KS2	357	566							
0006A	106		2	KS3	367	561							
00150	336		7	K3X3	217								
00008	8		6	LAT	122	704	705	962	963				
00024	36		6	LATB	130	901	902						
00114	276		9	LATL	308	309	702	703					
00024	36		7	LCA1	219								
00028	40		7	LCA4	220								
0002C	44		1	LG	328	436	477						
00028	40		6	LGO	131	923	924						
0006E	110		4	LITE	41								
00020	32		6	LONB	129	903	904						
0000C	12		6	LONG	123	921	922						
00118	280		9	LONL	310	311	919	920					
00054	84		7	L3X3	218								
00000	0		7	MATCOM	180								

XREF 1 DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 5

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
00028	40		8	MCSI	160	969	974	990	995								
0006C	108		4	MODE	40												
*****UNDEFINED*****				MULFD		712	717	743	749	755	785	790	812	817	864	877	883
						890	895	912									
*****UNDEFINED*****				MULS33		469	474	479									
*****UNDEFINED*****				MUL33		697											
00064	100		4	NAVF	36	860											
003D6	982		2	NAVI	856	854											
00024	36		8	NCCD	158	956	967	972	992	997	1000						
0002A	42		8	NCCU	161	1007	1008										
00004	4		9	NFOUR	227	828											
00000	0		5	NIACOM	108												
00000	0		6	NICOM	119												
00018	24		9	NINE	238	535	537										
0002C	44		7	NMO	191	761	948	950									
00008	8		9	NONE	229	760											
00036	54		5	NSCH	117												
00006	6		9	NT#O	228												
00006	6		2	N1200	339	966											
00004	4		2	N1680	338	971											
00002	2		2	N4800	337	996											
00000	0		9	N64	224	955											
00000	0		2	N7200	336	991											
000C0	192		7	OC	208	482	777										
00028	40		9	OMEG	246												
00024	36		9	OMGA	245	909											
0000A	10		9	ONE	230	548	552	859	957	973							
00020	32		9	ONHLF	244												
000AC	172		4	O14	72												
00094	148		4	O18	60												
000A4	164		4	O21	68	602											
000A6	166		4	O22	69	607											
000A2	162		4	O23	67	597											
000A8	168		4	O24	70												
000CA	202		4	O25	87												
00096	150		4	O30	61												
00098	152		4	O31	62												
0009A	154		4	O32	63												
0009C	156		4	O33	64												
0009E	158		4	O34	65												
000A0	160		4	O35	66												
00086	134		4	O4A	53												
00088	136		4	O4B	54												
0008A	138		4	O4C	55												
00082	178		4	O4D	75												
00084	180		4	O4E	76												
00072	114		4	O4F	43												
00074	116		4	O40	44												
00076	118		4	O41	45												
00078	120		4	O42	46												
0007A	122		4	O43	47												
0007C	124		4	O44	48												
0007E	126		4	O45	49												

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES					
0008C	140	4	046		56						
00080	128	4	047		50						
00082	130	4	048		51						
00084	132	4	049		52						
000D2	210	4	05A		91						
000C4	196	4	05B		84						
000C6	198	4	05D		85						
000C8	200	4	05E		86						
000A6	182	4	050		77						
000A8	184	4	051		78						
000AA	186	4	052		79						
000AC	188	4	053		80						
000AE	190	4	054		81						
000C0	192	4	055		82						
000C2	194	4	056		83						
00006	214	4	057		93						
00008	216	4	058		94						
000DA	218	4	059		95						
000EA	234	4	06A		103						
000EC	236	4	06B		104						
000AE	142	4	06C		57						
00090	144	4	06D		58						
00092	146	4	06E		59						
000CC	204	4	060		88						
000D4	212	4	062		92						
000DC	220	4	063		96						
000DE	222	4	064		97						
000E0	224	4	065		98						
000E2	226	4	066		99						
000E4	228	4	067		100						
000E6	230	4	068		101						
000E8	232	4	069		102						
000B0	176	4	071		74						
000AE	174	4	072		73						
00014	20	8	PHA		154	721	722				
00062	98	4	PHAS		35						
00068	104	4	PUSH		38						
00000	0	6	RAD		120	887	915	916			
0003A	58	4	RAT		20						
0003C	60	4	RATL		21						
00008	8	4	RATM		4	639	640				
0000C	12	4	RATP		5	637	638				
00014	20	7	RES1		186	383					
00018	24	7	RES2		187	391					
0001C	28	7	RES3		188						
00020	32	7	RES4		189						
00008	8	2	RMX		340	524					
00010	16	4	ROT1		6						
00012	18	4	ROT2		7						
00470	1136	2	RSET		936	762	935				
00050	80	1	RT		332	519	523	526	555	578	582
0005C	92	1	RTL		333	527	583	584			
00050	80	1	RT1		329	332	490	491			

XREF 1 DECK NAME=*INIT *

SKC 2000 CROSS REFERENCE DICTIONARY

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES
00054	84	1	4	RT2	330 506 509
00058	88	1	4	RT3	331 515 516
00004	4	6	4	RXYZ	121 917 918
00034	52	4	4	R1CT	17
00036	54	4	4	R2CT	18
00108	264	7	5	SA	210
00026	38	8	4	SAMI	159 958 1002 1005
00032	50	5	4	SAVT	115 983 984
000CC	204	6	6	SDVI	146 618
000D0	208	6	6	SDVJ	147
000D4	212	6	6	SDVK	148
00014	20	9	4	SEVEN	236
00034	52	6	6	SGCL	134 873 880 881 882 893 894
00008	8	7	4	SGDL	183 221 708 715 716 868 869
*****UNDEFINED*****				SINCOS	385 393 706 765 772 840 871
00012	18	9	4	SIA	235
00008	8	7	4	SL	221
00024	36	7	4	SMA	190 219 220 938 939
00000	0	4	4	SRT1	2 633 634
00004	4	4	4	SRT2	3 635 636
00000	0	7	5	SWT	181
0003E	62	7	4	S1	196 387 405 425
00042	66	7	4	S2	197 395 429 432
0002C	44	6	4	S2GC	132 884 885
00046	70	7	4	S3	198 437 458
0004A	74	7	4	S4	199 440 447 466
000A8	168	6	6	TEM	139 406 411 418 495 496 499 501 502 503 529 531 554 556 767 788 789 797 810 811
000B4	180	6	6	TEM0	140 768 769 781 782 815 816 865 866 867
000B8	184	6	6	TEM1	141 774 800 801 806 807 808 809
000BC	188	6	6	TEM2	142 775 776 778
0001A	26	9	4	TEN	239
000AA	106	4	4	TEST	39
0000E	14	9	4	THREE	233 987 989
0005B	88	4	4	TIME	32 736 737 925 926 980 981
00008	216	5	5	TLPO	149 930 931
0012C	300	7	4	T4	211 473 476
00070	112	4	4	TMPR	42
00150	336	7	4	T41	212 214 215 217 478 481
0000C	12	9	4	TWO	231 232 994 1004
0005C	92	4	4	T0	33 738 739 928 929
00018	24	8	4	VAX	155 156 157 941
00000	0	8	4	VAX1	151 622
0001C	28	8	4	VAY	156
00020	32	8	4	VAZ	157
00066	102	8	4	VC1X	174 175 176 724
00072	114	8	4	VC2X	175
0007E	126	8	4	VC3X	176
00174	372	7	5	VECT	213 831 858
0008A	138	8	4	VF1X	177 178 179
00096	150	8	4	VF2X	178
000A2	162	8	4	VF3X	179
0004C	76	4	4	VRTV	26

XREF 1 DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 8

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES
0005E	94	8		VTB	172	744 745
00062	98	8		VTC	173	750 751
00014	20	6		VX	126	905 906
00018	24	6		VY	127	913 914
0001C	28	6		VZ	128	907 908
00084	132	6		V1	138	471
00000	0	4		WLDCOM	1	
000C0	192	6		X	143	891 892 910 911
0002E	46	8		XA	162	945
00036	54	8		XB	163	
0003E	62	8		XC	164	
000C4	196	6		Y	144	899 900
00046	70	8		YA	171	
00046	70	8		YA1	165	171
0004A	74	8		YA2	166	
0004E	78	8		YB1	167	
00052	82	8		YB2	168	
00056	86	8		YC1	169	
0005A	90	8		YC2	170	
000C8	200	6		Z	145	896 897
0001C	28	9		ZERO	240	242 382 392 401 404 408 415 426 433 443 451 457 463 498 521 522 530 542 580 581 594 598 603 613 649 650 662 663 675 676 720 793 794 804 805 821 833 843 844 849 898 937 968 978 1001 1006

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VERSION K20A0503      DECK NAME=*ALIGN *                                                                    PAGE   1

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
                                  $FAP ALIGN
              1 05100  20736 -2   BUFORG   SETX   5100            BUFFER ORIGON
              2                            EVEN
                                  *
                                  *
                                  *
                                  *    GEANS WORLD COMMON VARIABLES DATA AREA
                                  *
              3                4  WLDCOM   COMMON  4
                                  *
              4 00000      0   4  SRT1     BSS    4               GYRO ROTOR 1 SPEED ACCUMULATION
              5 00004      4   4  SRT2     BSS    4               GYRO ROTOR 2 SPEED ACCUMULATION
              6 00008      8   4  RATM     BSS    4               NEGATIVE R.A.T. PULSE ACCUMULATION
              7 0000C     12   4  RATP     BSS    4               POSITIVE R.A.T. PULSE ACCUMULATION
              8 00010     16   4  ROT1     BSS    2               GYRO 1 ROTOR SPEED ( REV/SECOND )
              9 00012     18   4  ROT2     BSS    2               GYRO 2 ROTOR SPEED ( REV/SECOND )
             10 00014     20   4  DVXG     BSS    4               ACCUMULATED DELT VX
             11 00018     24   4  DVYG     BSS    4               ACCUMULATED DELT VY
             12 0001C     28   4  DVZG     BSS    4               ACCUMULATED DELT VZ
             13 00020     32   4  DPVV     BSS    4               DOPPLER VERTICAL VELOCITY ACCUMULATION
             14 00024     36   4  DPDV     BSS    4               DOPPLER DRIFT    VELOCITY ACCUMULATION
             15 00028     40   4  DPHV     BSS    4               DOPPLER HEADING  VELOCITY ACCUMULATION
             16 0002C     44   4  GMT      BSS    4               GREENWICH MEAN TIME
             17 00030     48   4  BTE1     BSS    2               BITE ACTUAL STATE MASK WORD 1
             18 00032     50   4  BTE3     BSS    2               BITE ACTUAL STATE MASK WORD 3
             19 00034     52   4  R1CT     BSS    2               COUNTER FOR ROTOR 1 SPEED FAULT
             20 00036     54   4  R2CT     BSS    2               COUNTER FOR ROTOR 2 SPEED FAULT
             21 00038     56   4  CIPM     BSS    2               INPUT POWER MONITOR COUNTER
             22 0003A     58   4  RAT      BSS    2               REDUNDANT AXIS TORQUING (PULSES)
             23 0003C     60   4  RATL     BSS    2               COUNTER FOR RAT
             24 0003E     62   4  DVX      BSS    4               INPUT DELTA VX
             25 00042     66   4  DVY      BSS    4               INPUT DELTA VY
             26 00046     70   4  DVZ      BSS    4               INPUT DELTA VZ
             27 0004A     74   4  CYLE     BSS    2               OUT-OF-TIME FLAG
             28 0004C     76   4  VRTV     BSS    2               DOPPLER VERTICAL VELOCITY
             29 0004E     78   4  DRFV     BSS    2               DOPPLER DRIFT    VELOCITY
             30 00050     80   4  HDGV     BSS    2               DOPPLER HEADING  VELOCITY
             31 00052     82   4  CTR1     BSS    2               PHASE TIMER
             32 00054     84   4  CTR2     BSS    2               INTERNAL SEQUENCING COUNTER
             33 00056     86   4  CTR3     BSS    2               INTERNAL SEQUENCING COUNTER
             34 00058     88   4  TIME     BSS    4               TIME FROM SYSTEM TURN ON (SECONDS)
             35 0005C     92   4  T0       BSS    4               TIME AT ENTRY TO NAV
             36 00060     96   4  ITER     BSS    2               ITERATION COUNTER
             37 00062     98   4  PHAS     BSS    2               AUTOMATIC SEQUENCING PHASE
             38 00064    100   4  NAVF     BSS    2               IN-NAVIGATION MODE FLAG (2/3 - MAN/AUTO)
             39 00066    102   4  DATA     BSS    2               SYSTEM DATA SWITCH (0-7)
             40 00068    104   4  PUSH     BSS    2               PUSHBUTTON SWITCH (0-31)
             41 0006A    106   4  TEST     BSS    2               PRESS TO TEST SWITCH (0/-1)
             42 0006C    108   4  MODE     BSS    2               SYSTEM MODE SWITCH
             43 0006E    110   4  LITE     BSS    2               CDU LIGHTS (SOFTWARE)
             44 00070    112   4  TMPR     BSS    2               TEMP STORAGE LOCATION
                                  *
                                  *    SODL DATA AREA
                                  *
             45 00072    114   4  04F      BSS    2        01     FRAME MARKER
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VERSION X20A0503 DECK NAME=*ALIGN *

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM				SOURCE	
46	00074	116	4		040	BSS	2	02	MSH OF GMT
47	00076	118	4		041	BSS	2	03	LSH OF GMT
48	00078	120	4		042	BSS	2	04	MSH OF LATITUDE
49	0007A	122	4		043	BSS	2	05	LSH OF LATITUDE
50	0007C	124	4		044	BSS	2	06	MSH OF LONGITUDE
51	0007E	126	4		045	BSS	2	07	LSH OF LONGITUDE
52	00080	128	4		047	BSS	2	08	MSH OF VERTICAL VELOCITY
53	00082	130	4		048	BSS	2	09	LSH OF VERTICAL VELOCITY
54	00084	132	4		049	BSS	2	10	MSH OF EAST VELOCITY
55	00086	134	4		04A	BSS	2	11	LSH OF EAST VELOCITY
56	00088	136	4		04B	BSS	2	12	MSH OF NORTH VELOCITY
57	0008A	138	4		04C	BSS	2	13	LSH OF NORTH VELOCITY
58	0008C	140	4		046	BSS	2	14	I.N.S. ALTITUDE
59	0008E	142	4		06C	BSS	2	15	AHRS HEADING
60	00090	144	4		06D	BSS	2	16	AHRS PITCH
61	00092	146	4		06E	BSS	2	17	AHRS ROLL
62	00094	148	4		018	BSS	2	18	RESET,IMU,DPU,EAU,CDU,DCU,BATT BITE BITS
63	00096	150	4		030	BSS	2	19	3RD,4TH,5TH,6TH, RIGHT NUMERIC
64	00098	152	4		031	BSS	2	20	4 DISCRETES; R.ALPHA; 1ST,2ND R. NUMERIC
65	0009A	154	4		032	BSS	2	21	2ND,3RD,4TH,5TH LEFT NUMERIC
66	0009C	156	4		033	BSS	2	22	1ST,2ND WAYPOINT; L. ALPHA; 1ST L.NUMERIC
67	0009E	158	4		034	BSS	2	23	1ST,2ND FROM< 1ST,2ND TO
68	000A0	160	4		035	BSS	2	24	CDU/ACDU DISPLAY LIGHTS
69	000A2	162	4		023	BSS	2	25	HEADING
70	000A4	164	4		021	BSS	2	26	PITCH
71	000A6	166	4		022	BSS	2	27	ROLL
72	000A8	168	4		024	BSS	2	28	STEERING SIGNAL
73	000AA	170	4			BSS	2	29	BLANK
74	000AC	172	4		014	BSS	2	30	SEQ CNT,G1,2 RED,G1,2 TERM SHUTDOWN BITS
75	000AE	174	4		072	BSS	2	31	TORQUE FOR GIMBALS 1 AND 2
76	000B0	176	4		071	BSS	2	32	TORQUE FOR GIMBALS 3 AND 4
77	000B2	178	4		04D	BSS	2	33	ROTOR 1,2, ROTOR SPEED
78	000B4	180	4		04E	BSS	2	34	RAT AND VERTICAL VELOCITY
79	000B6	182	4		050	BSS	2	35	-,+ DELTA VX
80	000B8	184	4		051	BSS	2	36	-,+ DELTA VY
81	000BA	186	4		052	BSS	2	37	-,+ DELTA VZ
82	000BC	188	4		053	BSS	2	38	GIMBAL 1 RESOLVER
83	000BE	190	4		054	BSS	2	39	GIMBAL 2 RESOLVER
84	000C0	192	4		055	BSS	2	40	GIMBAL 3 RESOLVER
85	000C2	194	4		056	BSS	2	41	GIMBAL 4 RESOLVER
86	000C4	196	4		058	BSS	2	42	DATA,MODE,TST AND PUSHBUTTON SWITCHES
87	000C6	198	4		05D	BSS	2	43	BITE BITS
88	000C8	200	4		05E	BSS	2	44	BITE BITS
89	000CA	202	4		025	BSS	2	45	BAROMETRIC ALTITUDE AND BITE BITS
90	000CC	204	4		060	BSS	2	46	DRIFT AND HEADING VELOCITY
91	000CE	206	4			BSS	2	47	SPARE
92	000D0	208	4			BSS	2	48	SPARE
93	00002	210	4		05A	BSS	2	49	DELTA LATITUDE (FIX)
94	00004	212	4		062	BSS	2	50	DELTA LONGITUDE (FIX)
95	00006	214	4		057	BSS	2	51	VERTICAL DIFFERENCE VELOCITY
96	00008	216	4		058	BSS	2	52	CROSS TRACK DIFFERENCE VELOCITY
97	0000A	218	4		059	BSS	2	53	ALONG TRACK DIFFERENCE VELOCITY
98	0000C	220	4		063	BSS	2	54	A11 ALIGNMENT MATRIX
99	0000E	222	4		064	BSS	2	55	A21 ALIGNMENT MATRIX
100	000E0	224	4		065	BSS	2	56	A31 ALIGNMENT MATRIX

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VERSION K20A0503      DECK NAME=*ALIGN *                                                                      PAGE   3

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                       SOURCE
            101 000E2    226  4            066       BSS    2         57    A12 ALIGNMENT MATRIX
            102 000E4    228  4            067       BSS    2         58    A22 ALIGNMENT MATRIX
            103 000E6    230  4            068       BSS    2         59    A32 ALIGNMENT MATRIX
            104 000E8    232  4            069       BSS    2         60    A13 ALIGNMENT MATRIX
            105 000EA    234  4            06A       BSS    2         61    A23 ALIGNMENT MATRIX
            106 000EC    236  4            06B       BSS    2         62    A33 ALIGNMENT MATRIX
            107 000EE    238  4                      BSS    2         63    SPARE
            108 000F0    240  4                      BSS    2         64    SPARE
            109 000F2    242  4            AJ        BSS    36              ALIGNMENT MATRIX
                                           *
            110                   5        NIACOM    COMMON 5               NAV,INIT,AND ALIGN COMMON DATA
                                           *
                                           *   DELTA V'S IN I,J,K SPACE IN M/SEC/CC
                                           *
            111 00000      0  5            DVXI      BSS    4
            112 00004      4  5            DVYJ      BSS    4
            113 00008      8  5            DVZK      BSS    4
            114 0000C     12  5            A         BSS    36              TEMP 3X3 MATRIX A
            115 0000C     12  5            DCAR      EQU    A
            116 00030     48  5            FLGN      BSS    2               SAVE AJ(I,J) FLAG
            117 00032     50  5            SAVT      BSS    4               TIME OF LAST AJ ROTATION
            118 00036     54  5            ASCH      BSS    2               ALIGNMENT SCHEDULER
            119 00036     54  5            NSCH      EQU    ASCH            NAVIGATION SCHEDULER
            120 00038     56  5            CD04D     BSS    12              CD0(I)*DELT   I=4,6
                                           *
                                           *
            121                   7        MATCOM    COMMON 7               MATRIX,VECTOR,AND MISCELLANEOUS DATA
                                           *
            122 00000      0  7            SWT       BSS    4               SIN(OMEGA T)
            123 00004      4  7            CWT       BSS    4               COS(OMEGA T)
            124 00008      8  7            SGDL      BSS    4               SIN(GEODETIC LATITUDE)
            125 0000C     12  7            CGDL      BSS    4               COS(GEODETIC LATITUDE)
            126 00010     16  7            ALT       BSS    4               ALTITUDE
                                           *
                                           *    GIMBAL RESOLVER POSITION (BIAS EXCLUDED)
                                           *
            127 00014     20  7            RES1      BSS    4
            128 00018     24  7            RES2      BSS    4
            129 0001C     28  7            RES3      BSS    4
            130 00020     32  7            RES4      BSS    4
            131 00024     36  7            SRA       BSS    8               SUM OF 1-(G KNOWN)/(G ACCELERATION)
            132 0002C     44  7            NMO       BSS    2
                                           *
                                           *    COSINES OF CORRECTED GIMBAL ANGLES
                                           *
            133 0002E     46  7            C1        BSS    4
            134 00032     50  7            C2        BSS    4
            135 00036     54  7            C3        BSS    4
            136 0003A     58  7            C4        BSS    4
                                           *
                                           *    SINES OF CORRECTED GIMBAL ANGLES
                                           *
            137 0003E     62  7            S1        BSS    4
            138 00042     66  7            S2        BSS    4
            139 00046     70  7            S3        BSS    4
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VERSION K20A0503        DECK NAME=*ALIGN *                                                          PAGE   4

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                            SOURCE
            140 0004A     74  7          S4       BSS    4
                                         *
            141 0004E     78  7          KSN1     BSS    2                GAIN COLUMN INDEX
            142 00050     80  7          KSN2     BSS    2                GAIN COLUMN INDEX
            143 00052     82  7          KSN3     BSS    2                GAIN COLUMN INDEX
            144 00054     84  7          D1       BSS    36               TEMP 3X3 MATRIX
            145 00078    120  7          DG       BSS    36               TOTAL GIMBAL AND THEN TSP2
                                         *
                                         *    STATE MATRIX ( STORED ROW MAJOR ORDER )
                                         *****        E11 = PSI = HEADING
                                         *****        E12 = THETA = PITCH
                                         *****        E13 = PHI = ROLL
                                         *
                                         *
            146 0009C    156  7          E1       BSS    12
            147 000A8    168  7          E2       BSS    12
            148 000B4    180  7          E3       BSS    12
            149 000C0    192  7          DC       BSS    36               VEHICLE TO CASE TRANSFORMATION MATRIX
            150 000E4    228  7          D        BSS    36               TEMP 3X3 MATRIX
            151 00108    264  7          SA       BSS    36               SAVE AJ MATRIX
            152 0012C    300  7          TM       BSS    36               TEMP 3X3 MATRIX
            153 00150    336  7          TM1      BSS    36               TEMP 3X3 MATRIX
            154 00174    372  7          VECT     BSS    34               TABLE OF SUBROUTINE CALLS
            155 00150    336  7          AP       EQU    TM1              TEMP 3X1 VECTOR
            156 0015C    348  7          AT       EQU    TM1+12           TEMP 3X1 VECTOR
            157 000E4    228  7          J3X3     EQU    D
            158 00150    336  7          K3X3     EQU    TM1
            159 00054     84  7          L3X3     EQU    D1
            160 00024     36  7          LCA1     EQU    SRA              LAST GIMBAL 1 COMMAND
            161 00028     40  7          LCA4     EQU    SRA+4            LAST GIMBAL 4 COMMAND
            162 00008      8  7          SL       EQU    SGDL             SIN(LAT) GEODETIC
            163 0000C     12  7          CL       EQU    CGDL             COS(LAT) GEODETIC
                                         *
                                         *
            164                  8       IACOM    COMMON  8               INIT AND ALIGN DECKS COMMON DATA
                                         *
            165 00000      0  8          VAXI     BSS    12
            166 0000C     12  8          AK1T     BSS    4                G*DT*COS(LAT)
            167 00010     16  8          AK2T     BSS    4                G*DT*SIN(LAT)
            168 00014     20  8          PHA      BSS    4                PHASE ANGLE LAG OF FILTER IN PI RAD
            169 00018     24  8          VAX      BSS    12               SUM OF DVX,DVY,DVZ ERRORS IN M/SEC
            170 0001C     28  8          VAY      EQU    VAX+4
            171 00020     32  8          VAZ      EQU    VAX+8
            172 00024     36  8          NCCD     BSS    2                NUMBER OF CLOCK CYCLES COUNTING FROM
                                         *                                A NEGATIVE NUMBER
            173 00026     38  8          SAMI     BSS    2                SELECT ALIGN MODE INDEX
            174 00028     40  8          MCSI     BSS    2                MODE C SOLUTION INDEX
            175 0002A     42  8          NCCU     BSS    4                NUMBER OF COMPUTER CYCLES INTO MODE
            176 0002E     46  8          XA       BSS    8
            177 00036     54  8          XB       BSS    8
            178 0003E     62  8          XC       BSS    8
            179 00046     70  8          YA1      BSS    4                SUMMATION (EDVX)
            180 0004A     74  8          YA2      BSS    4                SUMMATION (EDVX*SIN(THR))
            181 0004E     78  8          YB1      BSS    4                SUMMATION (EDVY)
            182 00052     82  8          YB2      BSS    4                SUMMATION (EDVY*OMEGA*TIME)
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VERSION K20A0503      DECK NAME=*ALIGN *                                                              PAGE   5

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                     SOURCE
            183 00056     86 8           YC1       BSS    4          SUMMATION (EDVZ*COS(THR))
            184 0005A     90 8           YC2       BSS    4          SUMMATION (EDVZ*SIN(THR))
            185 00046     70 8           YA        EQU    YA1
            186 0005E     94 8           VTB       BSS    4          LOCAL GRAVITY*8.0
            187 00062     98 8           VTC       BSS    4          GL*DELT
            188 00066    102 8           VC1X      BSS    36
            189 00072    114 8           VC2X      EQU    VC1X+12
            190 0007E    126 8           VC3X      EQU    VC1X+24
            191 0008A    138 8           VF1X      BSS    36
            192 00096    150 8           VF2X      EQU    VF1X+12
            193 000A2    162 8           VF3X      EQU    VF1X+24
                                         *
                                         *    GEANS WORLD COMMON VARIABLES DATA AREA
                                         *
            194                 9        CONCOM    COMMON  9
                                         *
            195 00000      0 9 FFFFFFC0 N64       DEC    -64
            196                                    EVEN
R           197 00002      2 9           DCSK      BSS    2
            198 00004      4 9           NFOUR     BSS    2
            199 00006      6 9           NTWO      BSS    2
            200 00008      8 9           NONE      BSS    2
            201 0000A     10 9           ONE       BSS    2
            202 0000C     12 9           TWO       BSS    2
            203 0000E     14 9           THREE     BSS    2
            204 00010     16 9           FOUR      BSS    2
            205 00012     18 9           SIX       BSS    2
            206 00014     20 9           SEVEN     BSS    2
            207 00016     22 9           EIGHT     BSS    2
            208 00018     24 9           NINE      BSS    2
            209 0001A     26 9           TEN       BSS    2
            210 0001C     28 9           ZERO      BSS    2
            211 0001E     30 9           FONE      BSS    2
            212 0001C     28 9           DFONE     EQU    ZERO
            213                                    EVEN
            214 00020     32 9           ONHLF     BSS    4
            215 00024     36 9           OMGA      BSS    4          EARTH ROTATION RATE  RAD/SEC
            216 00028     40 9           OMEG      BSS    4           EARTH RATE   PI RAD/SEC
            217 0002C     44 9           KGDL      BSS    4          GEODETIC LATITUDE CONSTANT
            218 00030     48 9           DELT      BSS    4          DELTA TIME = 1/8 SECOND
            219 00034     52 9           D1032     BSS    4          DOUBLE PRECISION 1/32
            220 00038     56 9           D3032     BSS    4          =3/32
                                         *
                                         *    CALIBRATION DATA.    CD01-CD64
                                         *
            221                                    EVEN
            222 0003C     60 9           CD01      BSS    4          X ACCEL SCALE FACTOR  M/SEC/PULSE
            223 00040     64 9           CD02      BSS    4          Y ACCEL SCALE FACTOR  M/SEC/PULSE
            224 00044     68 9           CD03      BSS    4          Z ACCEL SCALE FACTOR  M/SEC/PULSE
            225 00048     72 9           CD04      BSS    4          X ACCEL BIAS   PULSE/SEC
            226 0004C     76 9           CD05      BSS    4          Y ACCEL BIAS   PULSE/SEC
            227 00050     80 9           CD06      BSS    4          Z ACCEL BIAS   PULSE/SEC
            228 00054     84 9           CD07      BSS    4          B11 ACCEL MISALIGNMENT
            229 00058     88 9           CD08      BSS    4          B12 ACCEL MISALIGNMENT
            230 0005C     92 9           CD09      BSS    4          B13 ACCEL MISALIGNMENT
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VERSION K20A0503 DECK NAME=*ALIGN *

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM				SOURCE
231	00060	96	9		CD10	BSS	4	B21 ACCEL MISALIGNMENT
232	00064	100	9		CD11	BSS	4	B22 ACCEL MISALIGNMENT
233	00068	104	9		CD12	BSS	4	B23 ACCEL MISALIGNMENT
234	0006C	108	9		CD13	BSS	4	B31 ACCEL MISALIGNMENT
235	00070	112	9		CD14	BSS	4	B32 ACCEL MISALIGNMENT
236						EVEN		
237	00074	116	9		CD15	BSS	4	B33 ACCEL MISALIGNMENT
238	00078	120	9		CD16	BSS	4	GYRO TORQUE,G INDEPEN,DYNE-CM
239	0007C	124	9		CD17	BSS	4	GYRO TORQUE,G INDEPEN,DYNE-CM
240	00080	128	9		CD18	BSS	4	GYRO TORQUE,G INDEPEN,DYNE-CM
241	00084	132	9		CD19	BSS	4	G11 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
242	00088	136	9		CD20	BSS	4	G12 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
243	0008C	140	9		CD21	BSS	4	G13 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
244	00090	144	9		CD22	BSS	4	G21 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
245	00094	148	9		CD23	BSS	4	G22 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
246	00098	152	9		CD24	BSS	4	G23 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
247	0009C	156	9		CD25	BSS	4	G31 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
248	000A0	160	9		CD26	BSS	4	G32 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
249	000A4	164	9		CD27	BSS	4	G33 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
250	000A8	168	9		CD28	BSS	4	RAT GYRO TORQUE DYNE-CM
251	000AC	172	9		CD29	BSS	4	RAT GYRO TORQUE DYNE-CM
252	000B0	176	9		CD30	BSS	4	SPEED COMP,G INDEPENDENT DYNE-CM
253	000B4	180	9		CD31	BSS	4	SPEED COMP,G INDEPENDENT DYNE-CM
254	000B8	184	9		CD32	BSS	4	SPEED COMP,G INDEPENDENT DYNE-CM
255	000BC	188	9		CD33	BSS	4	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
256	000C0	192	9		CD34	BSS	4	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
257	000C4	196	9		CD35	BSS	4	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
258	000C8	200	9		CD36	BSS	4	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
259	000CC	204	9		CD37	BSS	4	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
260	000D0	208	9		CD38	BSS	4	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
261	000D4	212	9		CD39	BSS	4	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
262						EVEN		
263	000D8	216	9		CD40	BSS	4	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
264	000DC	220	9		CD41	BSS	4	SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2
265	000E0	224	9		CD42	BSS	4	A18P RAT SPEED COMP DYNE-CM
266	000E4	228	9		CD43	BSS	4	A19P RAT SPEED COMP DYNE-CM
267	000E8	232	9		CD44	BSS	4	STARTING LOCUS PI RADIANS
268	000EC	236	9		CD45	BSS	4	BETA(1Z) MISALIGNMENT PI RADIANS
269	000F0	240	9		CD46	BSS	4	GIMBAL 1 RESOLVER BIAS PI RADIANS
270	000F4	244	9		CD47	BSS	4	GIMBAL 2 RESOLVER BIAS PI RADIANS
271	000F8	248	9		CD48	BSS	4	GIMBAL 3 RESOLVER BIAS PI RADIANS
272	000FC	252	9		CD49	BSS	4	GIMBAL 4 RESOLVER BIAS PI RADIANS
273	00100	256	9		CD50	BSS	4	PLATFORM AZIMUTH ALIGN IN PI RADIANS
274	00104	260	9		CD51	BSS	4	PLATFORM ELEVATION ALIGN IN PI RADIANS
275	00108	264	9		CD52	BSS	4	VERTICAL DAMPING CONSTANT,
					*			0.59594852 IN M/SEC/M*2**31
276	0010C	268	9		CD53	BSS	4	VERTICAL VELOCITY GAIN UNITLESS
277	00110	272	9		CD54	BSS	4	LOADED HEADING PI RADIANS
278	00114	276	9		CD55	BSS	4	LOADED LATITUDE PI RADIANS
279	00118	280	9		CD56	BSS	4	LOADED LONGITUDE PI RADIANS
280	0011C	284	9		CD57	BSS	4	LOCAL GRAVITY METERS/SEC**2
281	0011C	284	9		VT	EQU	CD57	VT=LOCAL GRAVITY
282	00120	288	9		CD58	BSS	4	1/SCALE FACTOR PULSES/M/SEC
283	00124	292	9		CD59	BSS	4	ROTOR 1 SPEED REVOLUTIONS/SEC
284	00128	296	9		CD60	BSS	4	ROTOR 2 SPEED REVOLUTIONS/SEC

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VERSION K20A0503      DECK NAME=*ALIGN *                                                                  PAGE   7

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                       SOURCE
             285 0012C    300  9            CD61     BSS    4              BARO ALT SCALE FACTOR   METERS/BIT
             286 00130    304  9            CD62     BSS    4              BARO ALTITUDE BIAS       BITS
             287 00134    308  9            CD63     BSS    4              ALTIMETER / AHRS FLAGS  NONE
             288 00138    312  9            CD64     BSS    4              ALTITUDE                METERS
                                            *
             289                 13                  USE    13
                                            *
             290                 13                  ORG    BUFORG
             291 05100  20736 13            DECFLG   BSS    2              PDP-11 FLAG
             292 05102  20738 13            BTIME    BSS    4              TIME
             293 05106  20742 13            BSX      BSS    12             SX,SY,AND SZ
             294 05112  20754 13            BAJ      BSS    36             MATRIX AJ
             295 05136  20790 13            BNMO     BSS    2              NMO FLAG
                                            *
             296                  1                  USE    1
                                            *
             297 00000      0  1            IIAM     BSS    2              RETURN ADDRESS LOCATION
             298 00002      2  1            IIDM     BSS    2              RETURN ADDRESS LOCATION
             299 00004      4  1            IIHM     BSS    2              RETURN ADDRESS LOCATION
             300 00006      6  1            IIKM     BSS    2
             301 00008      8  1            IIMM     BSS    2
             302 0000A     10  1            IIM3M    BSS    2
             303 0000C     12  1            IIOM     BSS    2
             304 0000E     14  1            IIPM     BSS    2
             305 00010     16  1            IIRM     BSS    2
             306 00012     18  1            IIR5M    BSS    2
             307 00014     20  1            ALNOR    BSS    2              ALNO RETURN ADDRESS LOCATION
             308 00016     22  1            CTHR     BSS    4              COS(EARTH MOTION ANGLE(THR))
             309 0001A     26  1            STHR     BSS    4              SIN(EARTH MOTION ANGLE(THR))
             310 0001E     30  1            RDVX     BSS    4              REFERENCE DVX   M/SEC/CC
             311 00022     34  1            RDVY     BSS    4              REFERENCE DVY   M/SEC/CC
             312 00026     38  1            RDVZ     BSS    4              REFERENCE DVZ   M/SEC/CC
             313 0002A     42  1            TEM      BSS    4
             314 0002E     46  1            TEM0     BSS    4
             315 00032     50  1            TEM2     BSS    4
             316 00036     54  1            TEM4     BSS    4
             317 0003A     58  1            DPTO     BSS    4              TEMP STORAGE FOR MULTIPLIER
             318 0003E     62  1            ACM      BSS    4              *ALIGN   AVERAGE(1-(G KNOWN)/(G ACCEL))
             319 00042     66  1            SX       BSS    4
             320 00046     70  1            SY       BSS    4
             321 0004A     74  1            SZ       BSS    4
                                            *
                                            *
             322                  2                  USE    2
                                            *
                                            *
             323 00000      0  2 C5C6F41A   PHC      HEX    C5C6F41A       COARSE FILTER PHASE ANGLE LAG,
             324 00002      2  2 39D83A28            HEX    39D83A28       0.00008414 PI RAD
             325 00004      4  2 4933FB85   PHF      HEX    4933FB85       FINE FILTER PHASE ANGLE LAG,
             326 00006      6  2 3B60374D            HEX    3B60374D       0.00073407 PI RAD
             327 00008      8  2 00000000   FKF      DEC64  0.01171875     FINE FILTER TIME CONSTANT
                                 3D600000
             328 0000C     12  2 00000000   FKC      DEC64  0.09375        COARSE FILTER TIME CONSTANT
                                 3EE00000
             329 00010     16  2 8C2A0F86   WOPP     DEC64  2.901440688E-06  EARTH MOVEMENT PI RAD/SEC*DELT
                                 37615B2F
             330 00010     16  2            WDT      EQU    WOPP
```

```
331 00014     20  2 00000000 0F8       DEC64  8.0            DOUBLE PRECISION 8.0
                    42400000
                          *
                          *     MATRIX LSSC(3,3,4) - FOR LEAST SQUARES SOLUTION
                          *
332 00018     24  2 D1FD1E8A LSSC      DEC64  .0031015155    A11 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    3C65A165
333 0001C     28  2 83738A67           DEC64  -.43541314     A12 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    BF9088C3
334 00020     32  2 FE43675D           DEC64  83.584381      A22 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    43D39599
335 00024     36  2 30FF1DCF           DEC64  .0033375035    B11 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    3C6D5002
336 00028     40  2 F4E6187E           DEC64  -.45749599     B12 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    BF8AE18A
337 0002C     44  2 96EDE0AE           DEC64  83.581613      B22 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    43D394E4
338 00030     48  2 92FA8021           DEC64  .0031014623    C11 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    3C65A0F3
339 00034     52  2 6659D12D           DEC64  -.43539325     C12 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    BF903A11
340 00038     56  2 88CFBFC6           DEC64  83.579845      C22 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    43D39470
341 0003C     60  2 589B915A           DEC64  .0022618870    A11 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    3C4A1E15
342 00040     64  2 618805FC           DEC64  -.22532000     A12 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    BF0CA2DB
343 00044     68  2 2AC32228           DEC64  30.461785      A22 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    42F9D8DE
344 00048     72  2 42151224           DEC64  .0023830795    B11 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    3C4E1688
345 0004C     76  2 ECC1DFB4           DEC64  -.23336071     B12 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    BF0884F1
346 00050     80  2 9668E7AC           DEC64  30.459761      B22 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    42F9D6C8
347 00054     84  2 9F053E58           DEC64  .0022618075    C11 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    3C4A1D6A
348 00058     88  2 F56069CE           DEC64  -.22529930     C12 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    BF0CA591
349 0005C     92  2 2DCF4620           DEC64  30.458451      C22 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    42F90574
350 00060     96  2 8CFA60C4           DEC64  .70883538E-03  A11 FINE LEAST SQUARE SOL'N (OPTION 2)
                    3A5CE891
351 00064    100  2 685655A3           DEC64  -.025572440    A12 FINE LEAST SQUARE SOL'N (OPTION 2)
                    BD97415A
352 00068    104  2 C2176724           DEC64  1.3065874      A22 FINE LEAST SQUARE SOL'N (OPTION 2)
                    40D39F20
353 0006C    108  2 37E24B62           DEC64  .83359380E-03  B11 FINE LEAST SQUARE SOL'N (OPTION 2)
                    3A6D42C4
354 00070    112  2 5750B899           DEC64  -.028575624    B12 FINE LEAST SQUARE SOL'N (OPTION 2)
                    BD8AF449
355 00074    116  2 CD340198           DEC64  1.3059618      B22 FINE LEAST SQUARE SOL'N (OPTION 2)
                    40D394E0
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VERSION K20A0503 DECK NAME=*ALIGN *

DIAGNOSTICS LINE	ADRES	OADRES	LC	PROGRAM	SOURCE		
356	00078	120	2	F5C042DC 3B5CE33F	DEC64	.70867687E-03	C11 FINE LEAST SQUARE SOL'N (OPTION 2)
357	0007C	124	2	23576A6D BD9752E6	DEC64	-.025555707	C12 FINE LEAST SQUARE SOL'N (OPTION 2)
358	00080	128	2	19462220 4003DEBB	DEC64	1.3055866	C22 FINE LEAST SQUARE SOL'N (OPTION 2)
359	00084	132	2	E898FA72 3B4172A6	DEC64	.49932754E-03	A11 FINE LEAST SQUARE SOL'N (OPTION 3)
360	00088	136	2	BD22A48A BD1F32C4	DEC64	-.011816612	A12 FINE LEAST SQUARE SOL'N (OPTION 3)
361	0008C	140	2	FB1E18EF 3FE32C59	DEC64	.3873955	A22 FINE LEAST SQUARE SOL'N (OPTION 3)
362	00090	144	2	35220F36 3B48D53C	DEC64	.55567131E-03	B11 FINE LEAST SQUARE SOL'N (OPTION 3)
363	00094	148	2	3978F286 BD17F770	DEC64	-.012699395	B12 FINE LEAST SQUARE SOL'N (OPTION 3)
364	00098	152	2	93228713 3FE30F42	DEC64	.3869516	B22 FINE LEAST SQUARE SOL'N (OPTION 3)
365	0009C	156	2	5D95C856 3B416911	DEC64	.49904191E-03	C11 FINE LEAST SQUARE SOL'N (OPTION 3)
366	000A0	160	2	717F9586 BD1F59CC	DEC64	-.011798001	C12 FINE LEAST SQUARE SOL'N (OPTION 3)
367	000A4	164	2	51AF1F3C 3FE2FD20	DEC64	.3866749	C22 FINE LEAST SQUARE SOL'N (OPTION 3)

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VERSION K20A0503      DECK NAME=*ALIGN *                                                                    PAGE   9

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                     SOURCE
                                               *
                                               *     SUB EXECUTIVE FOR ALIGNMENT
                                               *
                                               *     THIS ROUTINE IS ENTERED EVERY 1/32 SECOND WHEN THE SYSTEM IS
                                               *     IN ALIGN. IT CYCLES THROUGH FOUR BRANCHES TO PROVIDE A 1/8
                                               *     SECOND COMPUTATION CYCLE.
                                               *
                                               *     THE SUB-EXEC PROVIDES AN ALIGN BYPASS,WHEN NSCH IS LESS THAN
                                               *     ZERO, SO THAT SYNCHRONIZATION TO THE 1/8 SECOND CYCLE MAY BE
                                               *     INITIATED UPON FIRST ENTRY TO ALIGN AND MAINTAINED UPON RE-ENTRY
                                               *     FROM NAV.
                                               *
          369                                          EVEN
          370                                          ENTRY  IIA
R         371 000A8    168  2 00000000 IIA             PTR    IIAM
          372 000AA    170  2 1400001C IIA1            LDA    ZERO
          373 000AC    172  2 3C000064                 STA    NAVF           NAVF=0
          374 000AE    174  2 14000036                 LDA    ASCH
          375 000B0    176  2 A400000A                 ADU    ONE
          376 000B2    178  2 3C000036                 STA    ASCH           ASCH=ASCH+1
          377 000B4    180  2 6350                     JRL    IIA5A
          378 000B5    181  2     0841                 SLL    1
          379 000B6    182  2 06C0                     LXA    8
GENERATED                          0700
          380 000B8    184  2 744000BA                 RTA    IIA1A,8
          381 000BA    186  2 000000C2 IIA1A           PTR    IIA2
          382 000BC    188  2 000000DA                 PTR    IIA3
          383 000BE    190  2 000000DE                 PTR    IIA4
          384 000C0    192  2 00000102                 PTR    IIA5
          385 000C2    194  2 1400002C IIA2            LDA    NCCU+2
          386 000C4    196  2 5400002A                 LDB    NCCU
          387 000C6    198  2 9C00001C                 AFD    DFONE          NCCU=NCCU+1
          388 000C8    200  2 3C00002C                 STA    NCCU+2
          389 000CA    202  2 7C00002A                 STB    NCCU
          390 000CC    204  2 14000024                 LDA    NCCD
          391 000CE    206  2 A400000A                 ADU    ONE            NCCD=NCCD+1
          392 000D0    208  2 3C000024                 STA    NCCD
          393 000D2    210  2 64040000                 JS    IIC
          394 000D4    212  2 64040106                 JS     IID
          395 000D6    214  2 64040000                 JS     IIE
          396 000D8    216  2 74000000                 RTA    IIAM
          397 000DA    218  2 64040000 IIA3            JS     IIF
          398 000DC    220  2 74000000                 RTA    IIAM
          399 000DE    222  2 64040000 IIA4            JS     IIG
          400 000E0    224  2 640401A6                 JS     IIH
          401 000E2    226  2 14000024                 LDA    NCCD
          402 000E4    228  2 6320                     JRL    IIA5A
GENERATED                          0700
          403 000E6    230  2 14000026                 LDA    SAMI
          404 000E8    232  2 0841                     SLL    1
          405 000E9    233  2     06C0                 LXA    8
          406 000EA    234  2 744000EC                 RTA    IIA4A,8
          407 000EC    236  2 000000F2 IIA4A           PTR    IIA4B
          408 000EE    238  2 000000F6                 PTR    IIA4C
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VERSION K20A0503 DECK NAME=*ALIGN *

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                    SOURCE
            409 000F0    240   2 000000FA          PTR     IIA4D
            410 000F2    242   2 640402C8 IIA4B    JS      IIK
            411 000F4    244   2 6008              JRU     IIA4E
GENERATED                              0700
            412 000F6    246   2 64040322 IIA4C    JS      IIM
            413 000F8    248   2 6004              JRU     IIA4E
GENERATED                              0700
            414 000FA    250   2 640403A6 IIA4D    JS      IIO
            415 000FC    252   2 64040486 IIA4E    JS      IIP
            416 000FE    254   2 64040000          JS      RSET
            417 00100    256   2 74000000          RTA     IIAM
            418 00102    258   2 64040550 IIA5     JS      IIK
            419 00104    260   2 74000000 IIA5A    RTA     IIAM
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VERSION K20A0503      DECK NAME=*ALIGN *                                                                      PAGE  11

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
            421                                       ENTRY   IID
            422                                       EVEN
                                              *
                                              *    SUBROUTINE LPF (LOW PASS FILTER)
                                              *
                                              *    THIS ROUTINE CALCULATES THE FILTERED VALUES OF THE DELTA V'S,
                                              *    WHICH ARE USED IN MODE C ALIGN. BOTH THE FINE AND COARSE FILTERS
                                              *    ARE INITIALIZED IN MODE A ALIGN AND ARE COMPUTED DURING MODE B
                                              *    ALIGN IN ORDER TO ALLOW THEM TO SETTLE. ONCE THE COARSE FILTER
                                              *    IS NO LONGER USED, IT IS NO LONGER COMPUTED.
                                              *
            423 00106    262  2 00000002 IID       PTR    IIDM
            424 00108    264  2 5C220008 IID1      LDX    4,FKF,M
            425 0010A    266  2 5C2A000A           LDX    5,10,M          INITIALIZE POINTER
            426 0010C    268  2 16800000 IID1A     LDA    DVXI,5
            427 0010E    270  2 5680FFFE           LDB    DVXI-2,5
            428 00110    272  2 DE800088           SFD    VF1X-2,5        DVX(L)-VF(M)X    L=I,J,K; M=1,2,3
            429 00112    274  2 64040000           JS     MULFD           FKF*(DVX(L)-VF1(M)X)
            430 00114    276  2 9E800088           AFD    VF1X-2,5        VF(M)X=VF(M)X+FKF*(DVX(L)-VF(M)X)
            431 00116    278  2 3E80008A           STA    VF1X,5
            432 00118    280  2 7E800088           STB    VF1X-2,5
            433 0011A    282  2 6C2B0004           IMN    5,4,M           DECREMENT POINTER
            434 0011C    284  2 6430010C           JGU    IID1A
            435 0011E    286  2 5C42000C IID2      LDX    8,12,M          (XR8)=I    I=2,3
            436 00120    288  2 5C4A0000           LDX    9,0,M           (XR9)=I-1
            437 00122    290  2 1448008C IID2A     LDA    VF1X+2,9        (A,B)=VF(I-1)X
            438 00124    292  2 5448008A           LDB    VF1X,9
            439 00126    294  2 DC40008A           SFD    VF1X,8          VF(I-1)X-VF(I)X
            440 00128    296  2 64040000           JS     MULFD           FKF*(VF(I-1)X-VF(I)X)
            441 0012A    298  2 9C40008A           AFD    VF1X,8
            442 0012C    300  2 3C40008C           STA    VF1X+2,8        VF(I)X=VF(I)X+FKF*(VF(I-1)X-VF(I)X)
            443 0012E    302  2 7C40008A           STB    VF1X,8
            444 00130    304  2 6C4A0004           IMP    9,4,M           INCREMENT POINTER FOR Y,Z
            445 00132    306  2 6C420004           IMP    8,4,M
            446 00134    308  2 24430022           ICL    8,34,M          CHECK FOR END OF MATRIX
            447 00136    310  2 6430013A           JGU    IID3
            448 00138    312  2 6096               JU     IID2A
GENERATED                         0700
            449 0013A    314  2 1400002C IID3      LDA    NMO
            450 0013C    316  2 E4000014           SBU    SEVEN
            451 0013E    318  2 6252               JG     IID7            CHECK FOR NMO .GE. 7
GENERATED                         0700
            452 00140    320  2 5C22000C IID4      LDX    4,FKC,M
            453 00142    322  2 5C2A000A           LDX    5,10,M          INITIALIZE POINTER
            454 00144    324  2 16800000 IID4A     LDA    DVXI,5
            455 00146    326  2 5680FFFE           LDB    DVXI-2,5
            456 00148    328  2 DE800064           SFD    VC1X-2,5        DVX(L)-VC(M)X    L=I,J,K; M=1,2,3
            457 0014A    330  2 64040000           JS     MULFD           FKC*(DVX(L)-VC(M)X)
            458 0014C    332  2 9E800064           AFD    VC1X-2,5        VC(M)X=VC(M)X+FKC*(DVX(L)-VC(M)X)
            459 0014E    334  2 3E800066           STA    VC1X,5
            460 00150    336  2 7E800064           STB    VC1X-2,5
            461 00152    338  2 6C2B0004           IMN    5,4,M           DECREMENT POINTER
            462 00154    340  2 64300144           JGU    IID4A
            463 00156    342  2 5C42000C IID5      LDX    8,12,M          (XR8)=I    I=2,3
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VERSION K20A0503 DECK NAME=*ALIGN *

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            464 0015B    344  2 5C4A0000          LDX   9,0,M      (XR9)=I-1
            465 0015A    346  2 14480068 IID5A    LDA   VC1X+2,9   (A,B)=VC(I-1)X
            466 0015C    348  2 54480066          LDB   VC1X,9
            467 0015E    350  2 DC400066          SFD   VC1X,8     VC(I-1)X-VC(I)X
            468 00160    352  2 64040000          JS    MULFD      FKC*(VC(I-1)X-VC(I)X)
            469 00162    354  2 9C400066          AFD   VC1X,8
            470 00164    356  2 3C400068          STA   VC1X+2,8   VC(I)X=VC(I)X+FKC*(VC(I-1)X-VC(I)X)
            471 00166    358  2 7C400066          STB   VC1X,8
            472 00168    360  2 6C4A0004          IMP   9,4,M      INCREMENT POINTERS FOR Y,Z
            473 0016A    362  2 6C420004          IMP   8,4,M
            474 0016C    364  2 24430022          ICL   8,34,M     CHECK FOR END OF MATRIX
            475 0016E    366  2 64300172          JGU   IID6
            476 00170    368  2 6096              JU    IID5A
GENERATED                          0700
            477 00172    370  2 1400002C IID6     LDA   NMO
            478 00174    372  2 E4000010          SBU   FOUR       CHECK FOR NMO .LE. 3
            479 00176    374  2 6330              JL    IID8
GENERATED                          0700
            480 00178    376  2 5C2A000A          LDX   5,10,M
            481 0017A    378  2 1680007E IID6A    LDA   VC3X,5
            482 0017C    380  2 5680007C          LDB   VC3X-2,5
            483 0017E    382  2 3E800000          STA   DVXI,5     DVX(I)=VC(3)X
            484 00180    384  2 7E80FFFE          STB   DVXI-2,5
            485 00182    386  2 6C280004          IMN   5,4,M
            486 00184    388  2 6430017A          JGU   IID6A
            487 00186    390  2 14000002          LDA   PHC+2
            488 00188    392  2 54000000          LDB   PHC
            489 0018A    394  2 3C000016          STA   PHA+2      PHA=PHC
            490 0018C    396  2 7C000014          STB   PHA
            491 0018E    398  2 6018              JU    IID8
GENERATED                          0700
            492 00190    400  2 5C2A000A IID7     LDX   5,10,M
            493 00192    402  2 168000A2 IID7A    LDA   VF3X,5
            494 00194    404  2 568000A0          LDB   VF3X-2,5
            495 00196    406  2 3E800000          STA   DVXI,5     DVX(I)=VF(3)X
            496 00198    408  2 7E80FFFE          STB   DVXI-2,5
            497 0019A    410  2 6C280004          IMN   5,4,M
            498 0019C    412  2 64300192          JGU   IID7A
            499 0019E    414  2 14000006          LDA   PHF+2
            500 001A0    416  2 54000004          LDB   PHF
            501 001A2    418  2 3C000016          STA   PHA+2      PHA=PHF
            502 001A4    420  2 7C000014          STB   PHA
            503 001A6    422  2 74000002 IID8     RTA   IIDM
```

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VERSION K20A0503      DECK NAME=*ALIGN *                                                                    PAGE  13

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            505                                     ENTRY    IIH
            506                                     EVEN
                                            *
                                            *   REFERENCE PROFILE - COMPUTE REFERENCE DELTA V'S RDVX,RDVY,
                                            *   AND RDVZ.
                                            *
            507 001A8    424  2 00000004 IIH    PTR    IIHM
            508 001AA    426  2 5C220010 IIH1   LDX    4,WDT,M
            509 001AC    428  2 1400002C        LDA    NCCU+2
            510 001AE    430  2 5400002A        LDB    NCCU
            511 001B0    432  2 DC000020        SFD    ONHLF      (NCCU-0.5)
            512 001B2    434  2 64040000        JS     MULFD      WDT*(NCCU-0.5)
            513 001B4    436  2 DC000014        SFD    PHA        (WDT*(NCCU-0.5)-PHA)
            514 001B6    438  2 64040000        JS     SINCOS
            515 001B8    440  2 6004            JRU    *+4
GENERATED                            0700
            516 001BA    442  2 0000001A        PTR    STHR       SIN(WDT*(NCCU-0.5)-PHA)
            517 001BC    444  2 3C000018        STA    CTHR+2
            518 001BE    446  2 7C000016        STB    CTHR       COS(WDT*(NCCU-0.5)-PHA)
            519 001C0    448  2 5C22000C IIH2   LDX    4,AK1T,M
            520 001C2    450  2 14000018        LDA    CTHR+2
            521 001C4    452  2 54000016        LDB    CTHR
            522 001C6    454  2 64040000        JS     MULFD
            523 001C8    456  2 3C000020        STA    RDVX+2     RDVX = AK1T*CTHR
            524 001CA    458  2 7C00001E        STB    RDVX
            525 001CC    460  2 1400001C        LDA    STHR+2
            526 001CE    462  2 5400001A        LDB    STHR
            527 001D0    464  2 64040000        JS     MULFD
            528 001D2    466  2 3C000024        STA    RDVY+2     RDVY=AK1T*STHR
            529 001D4    468  2 7C000022        STB    RDVY
            530 001D6    470  2 14000012        LDA    AK2T+2
            531 001D8    472  2 54000010        LDB    AK2T
            532 001DA    474  2 3C000028        STA    RDVZ+2     RDVZ=AK2T
            533 001DC    476  2 7C000026        STB    RDVZ
            534 001DE    478  2 5C220030        LDX    4,DELT,M
            535 001E0    480  2 5C2A000A        LDX    5,10,M
            536 001E2    482  2 1680001E IIH2A  LDA    RDVX,5
            537 001E4    484  2 5680001C        LDB    RDVX-2,5
            538 001E6    486  2 64040000        JS     MULFD
            539 001E8    488  2 3E80001E        STA    RDVX,5     RDVX(I)=DELT*RDVX(I)     I=1,3
            540 001EA    490  2 7E80001C        STB    RDVX-2,5
            541 001EC    492  2 6C2B0004        IMN    5,4,M
            542 001EE    494  2 643001E2        JGU    IIH2A
            543 001F0    496  2 14000026 IIH3   LDA    SAMI
            544 001F2    498  2 0841            SLL    1
            545 001F3    499  2      06C0       LXA    8
            546 001F4    500  2 744001F6        RTA    IIH3A,8
            547 001F6    502  2 0000029E IIH3A  PTR    IIJ
            548 001F8    504  2 00000284        PTR    IIL
            549 001FA    506  2 000001FC        PTR    IIN
                                            *
                                            *    SUMMING FOR LEAST SQUARES SOLUTION
                                            *
            550 001FC    508  2          IIN    EQU    *
```

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VERSION K20A0503       DECK NAME=*ALIGN *                                                              PAGE  14

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            551 001FC     508  2 1400001C IIN1      LDA     ZERO
            552 001FE     510  2 3C00002C           STA     TEM+2          CLEAR SUM
            553 00200     512  2 3C00002A           STA     TEM
            554 00202     514  2 5C2A000A           LDX     5,10,M
            555 00204     516  2 5EA2003C           LDX     4,DVX-2,5,M
            556 00206     518  2 1680003E IIN1A     LDA     DVX,5
            557 00208     520  2 5680003C           LDB     DVX-2,5
            558 0020A     522  2 64040000           JS      MULFD          DVX(I)*DVX(I)   I=1,3
            559 0020C     524  2 9C00002A           AFD     TEM
            560 0020E     526  2 3C00002C           STA     TEM+2          (DVX**2+DVY**2+DVZ**2)
            561 00210     528  2 7C00002A           STB     TEM
            562 00212     530  2 6C230004           IMN     4,4,M
            563 00214     532  2 6C280004           IMN     5,4,M
            564 00216     534  2 64300206           JGU     IIN1A
            565 00218     536  2 64040000           JS      DECSQ
            566 0021A     538  2 3C00002C           STA     TEM+2          SQRT(DVX**2+DVY**2+DVZ**2)
            567 0021C     540  2 7C00002A           STB     TEM
            568 0021E     542  2 5C22002A           LDX     4,TEM,M
            569 00220     544  2 14000064           LDA     VTC+2
            570 00222     546  2 54000062           LDB     VTC
            571 00224     548  2 64040000           JS      DVFD           VTC/SQRT(DVX**2+DVY**2+DVZ**2)
            572 00226     550  2 3C00003C           STA     DPTO+2
            573 00228     552  2 7C00003A           STB     DPTO
            574 0022A     554  2 5C22003A           LDX     4,DPTO,M
            575 0022C     556  2 5C2A000A           LDX     5,10,M
            576 0022E     558  2 1680003E IIN1B     LDA     DVX,5
            577 00230     560  2 5680003C           LDB     DVX-2,5
            578 00232     562  2 64040000           JS      MULFD          DPTO*DVX(I)   I=1,3
            579 00234     564  2 DE80001C           SFD     RDVX-2,5       DPTO*DVX(I)-RDVX(I)
            580 00236     566  2 3E80002E           STA     TEM0,5
            581 00238     568  2 7E80002C           STB     TEM0-2,5       TEM0(I)=DPTO*DVX(I)-RDVX(I)
            582 0023A     570  2 6C2B0004           IMN     5,4,M
            583 0023C     572  2 6430022E           JGU     IIN1B
            584 0023E     574  2 1400001E           LDA     FONE
            585 00240     576  2 5400001C           LDB     ZERO
            586 00242     578  2 DC00003A           SFD     DPTO
            587 00244     580  2 9C000024           AFD     SRA            SRA=(SRA+1.0-DPTO)
            588 00246     582  2 3C000026           STA     SRA+2
            589 00248     584  2 7C000024           STB     SRA
            590 0024A     586  2 14000030           LDA     TEM0+2
            591 0024C     588  2 5400002E           LDB     TEM0
            592 0024E     590  2 9C000046           AFD     YA1
            593 00250     592  2 3C000048           STA     YA1+2          YA1=YA1+TEM0
            594 00252     594  2 7C000046           STB     YA1
            595 00254     596  2 5C22001A           LDX     4,STHR,M
            596 00256     598  2 14000030           LDA     TEM0+2
            597 00258     600  2 5400002E           LDB     TEM0
            598 0025A     602  2 64040000           JS      MULFD          STHR*TEM0
            599 0025C     604  2 9C00004A           AFD     YA2
            600 0025E     606  2 3C00004C           STA     YA2+2          YA2=YA2+STHR*TEM0
            601 00260     608  2 7C00004A           STB     YA2
            602 00262     610  2 14000038           LDA     TEM4+2
            603 00264     612  2 54000036           LDB     TEM4
            604 00266     614  2 64040000           JS      MULFD          STHR*TEM4
            605 00268     616  2 9C00005A           AFD     YC2
```

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VERSION K20A0503      DECK NAME=*ALIGN *                                                          PAGE  15

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            606 0026A    618  2 3C00005C         STA    YC2+2        YC2=YC2+STHR*TEM4
            607 0026C    620  2 7C00005A         STB    YC2
            608 0026E    622  2 5C220016         LDX    4,CTHR,M
            609 00270    624  2 14000038         LDA    TEM4+2
            610 00272    626  2 54000036         LDB    TEM4
            611 00274    628  2 64040000         JS     MULFD        TEM4*CTHR
            612 00276    630  2 9C000056         AFD    YC1          YC1=YC1+TEM4*CTHR
            613 00278    632  2 3C000058         STA    YC1+2
            614 0027A    634  2 7C000056         STB    YC1
            615 0027C    636  2 14000034         LDA    TEM2+2
            616 0027E    638  2 54000032         LDB    TEM2
            617 00280    640  2 9C00004E         AFD    YB1          YB1=YB1+TEM2
            618 00282    642  2 3C000050         STA    YB1+2
            619 00284    644  2 7C00004E         STB    YB1
            620 00286    646  2 5C220030         LDX    4,DELT,M
            621 00288    648  2 1400002C         LDA    NCCU+2
            622 0028A    650  2 5400002A         LDB    NCCU
            623 0028C    652  2 64040000         JS     MULFD        NCCU*DELT
            624 0028E    654  2 5C220032         LDX    4,TEM2,M
            625 00290    656  2 64040000         JS     MULFD        TEM2*(NCCU*DELT)
            626 00292    658  2 5C220024         LDX    4,OMGA,M
            627 00294    660  2 64040000         JS     MULFD        TEM2*(NCCU*DELT)*OMGA
            628 00296    662  2 9C000052         AFD    YB2          YB2=YB2+TEM2*(NCCU*DELT)*OMGA
            629 00298    664  2 3C000054         STA    YB2+2
            630 0029A    666  2 7C000052         STB    YB2
            631 0029C    668  2 74000004         RTA    IIRM
                                            *
                                            *   SUMMING FOR EARTH POLAR AXIS SOLUTION
                                            *
            632 0029E    670  2             IIJ   EQU    *
            633 0029E    670  2 64040000 IIJ1    JS     VECADD       VAXI(I)=VAXI(I)+DVXI(I)
            634 002A0    672  2 6008             JRU    *+8
GENERATED                         0700
            635 002A2    674  2 00000000         PTR    VAXI
            636 002A4    676  2 00000000         PTR    DVXI
            637 002A6    678  2 00000000         PTR    VAXI
            638 002A8    680  2 64040000         JS     VECADD       VAX(I)=VAX(I)+DVX(I)
            639 002AA    682  2 6008             JRU    *+3
GENERATED                         0700
            640 002AC    684  2 00000018         PTR    VAX
            641 002AE    686  2 0000003E         PTR    DVX
            642 002B0    688  2 00000018         PTR    VAX
            643 002B2    690  2 74000004         RTA    IIRM
                                            *
                                            *   SUMMING FOR LOCAL LEVEL SOLUTION
                                            *
            644 002B4    692  2             IIL   EQU    *
            645 002B4    692  2 5C2A000A         LDX    5,10,M       INITIALIZE LOOP COUNTER
            646 002B6    694  2 1680003E IIL1    LDA    DVX,5
            647 002B8    696  2 5680003C         LDB    DVX-2,5
            648 002BA    698  2 DE80001C         SFD    RDVX-2,5     DVX(I)-RDVX(I)
            649 002BC    700  2 9E800016         AFD    VAX-2,5      VAX(I)=VAX(I)+DVX(I)-RDVX(I)
            650 002BE    702  2 3E800018         STA    VAX,5
            651 002C0    704  2 7E800016         STB    VAX-2,5
            652 002C2    706  2 6C2B0004         IMN    5,4,M        DECREMENT COUNTER FOR NEXT ELEMENT
```

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VERSION K20A0503    DECK NAME=*ALIGN *                    SOURCE

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM
          653 002C4   708  2 64300286      JGU    IIL1
          654 002C6   710  2 74000004      RTA    IIMM
```

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VERSION K20A0503      DECK NAME=*ALIGN *                                                              PAGE  17

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
             656                                        ENTRY  IIK
             657                                        EVEN
                                               *
                                               *   EARTH POLAR AXIS SOLUTION
                                               *
             658 002C8      712  2 00000006 IIK     PTR    IIKM
             659 002CA      714  2 5C22000C IIK2    LDX    4,AKIT,M
             660 002CC      716  2 1400001A         LDA    VAX+2
             661 002CE      718  2 54000018         LDB    VAX
             662 002D0      720  2 64040000         JS     DVFD          VAX/AKIT
             663 002D2      722  2 3C000034         STA    TEM2+2
             664 002D4      724  2 7C000032         STB    TEM2          TEM2=VAX/AKIT
             665 002D6      726  2 1400001E         LDA    VAY+2
             666 002D8      728  2 5400001C         LDB    VAY
             667 002DA      730  2 64040000         JS     DVFD          VAY/AKIT
             668 002DC      732  2 3C000030         STA    TEM0+2
             669 002DE      734  2 7C00002E         STB    TEM0          TEM0=VAY/AKIT
             670 002E0      736  2 5C22002E IIK3    LDX    4,TEM0,M
             671 002E2      738  2 64040000         JS     MULFD         TEM0**2
             672 002E4      740  2 3C00002C         STA    TEM+2
             673 002E6      742  2 7C00002A         STB    TEM
             674 002E8      744  2 5C220032         LDX    4,TEM2,M
             675 002EA      746  2 14000034         LDA    TEM2+2
             676 002EC      748  2 54000032         LDB    TEM2
             677 002EE      750  2 64040000         JS     MULFD         TEM2**2
             678 002F0      752  2 9C00002A         AFD    TEM           (TEM0**2+TEM2**2)
             679 002F2      754  2 64040000         JS     DECSW         SQRT(TEM0**2+TEM2**2)
             680 002F4      756  2 3C00002C         STA    TEM+2
             681 002F6      758  2 7C00002A         STB    TEM
             682 002F8      760  2 5C22002A         LDX    4,TEM,M
             683 002FA      762  2 14000030         LDA    TEM0+2
             684 002FC      764  2 5400002E         LDB    TEM0
             685 002FE      766  2 64040000         JS     DVFD          TEM0/SQRT(TEM0**2+TEM2**2)
             686 00300      768  2 3C000002         STA    SWT+2
             687 00302      770  2 7C000000         STB    SWT
             688 00304      772  2 14000034         LDA    TEM2+2
             689 00306      774  2 54000032         LDB    TEM2
             690 00308      776  2 64040000         JS     DVFD          TEM2/SQRT(TEM0**2+TEM2**2)
             691 0030A      778  2 3C000006         STA    CWT+2
             692 0030C      780  2 7C000004         STB    CWT
             693 0030E      782  2 1400001C IIK4    LDA    ZERO
             694 00310      784  2 5C2A000A         LDX    5,10,M
             695 00312      786  2 3E800042 IIK4A   STA    SX,5          SX=SY=SZ=0
             696 00314      788  2 6C280002         IMN    5,2,M
             697 00316      790  2 64300312         JGU    IIK4A
             698 00318      792  2 3C000040         STA    ACM+2
             699 0031A      794  2 3C00003E         STA    ACM           ACM=0
             700 0031C      796  2 3C000016         STA    PHA+2
             701 0031E      798  2 3C000014         STA    PHA           PHA=0
             702 00320      800  2 74000006         RTA    IIKM
```

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VERSION K20A0503      DECK NAME=*ALIGN *                                                                   PAGE  18

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                            SOURCE
            704                                      ENTRY  IIM
            705                                      EVEN
                                         *
                                         *   LOCAL LEVEL SOLUTION
                                         *
            706 00322    802  2 00000008 IIM        PTR    IIMM
            707 00324    804  2 5C22005E IIMI       LDX    4,VTB,M
            708 00326    806  2 5C2A000A            LDX    5,10,M
            709 00328    808  2 16800018 IIM1A      LDA    VAX,5
            710 0032A    810  2 56800016            LDB    VAX-2,5
            711 0032C    812  2 64040000            JS     DVFD         VAX(I)/VTB
            712 0032E    814  2 3E80002E            STA    TEM0,5       TEM0(I)=VTB*VAX(I)
            713 00330    816  2 7E80002C            STB    TEM0-2,5
            714 00332    818  2 6C2B0004            IMN    5,4,M
            715 00334    820  2 64300328            JGU    IIM1A
            716 00336    822  2 5C220032 IIM2       LDX    4,TEM2,M
            717 00338    824  2 1400000E            LDA    CGDL+2
            718 0033A    826  2 5400000C            LDB    CGDL
            719 0033C    828  2 64040000            JS     MULFD        TEM2*CGDL
            720 0033E    830  2 3C00004C            STA    SZ+2
            721 00340    832  2 7C00004A            STB    SZ           SZ=TEM2*CGDL
            722 00342    834  2 1400000A            LDA    SGDL+2
            723 00344    836  2 54000008            LDB    SGDL
            724 00346    838  2 64040000            JS     MULFD        TEM2*SGDL
            725 00348    840  2 3C000044            STA    SX+2
            726 0034A    842  2 7C000042            STB    SX           SX=TEM2*SGDL
            727 0034C    844  2 1400001C            LDA    ZERO
            728 0034E    846  2 5400001C            LDB    ZERO
            729 00350    848  2 DC000042            SFD    SX           SX=-SX
            730 00352    850  2 3C000044            STA    SX+2
            731 00354    852  2 7C000042            STB    SX
            732 00356    854  2 5C22002E            LDX    4,TEM0,M
            733 00358    856  2 14000030            LDA    TEM0+2
            734 0035A    858  2 5400002E            LDB    TEM0
            735 0035C    860  2 64040000            JS     MULFD        TEM0**2
            736 0035E    862  2 3C00002C            STA    TEM+2
            737 00360    864  2 7C00002A            STB    TEM
            738 00362    866  2 5C220036            LDX    4,TEM4,M
            739 00364    868  2 14000038            LDA    TEM4+2
            740 00366    870  2 54000036            LDB    TEM4
            741 00368    872  2 64040000            JS     MULFD        TEM4**2
            742 0036A    874  2 9C00002A            AFD    TEM          (TEM0**2+TEM4**2)
            743 0036C    876  2 64040000            JS     DECSQ        SQRT(TEM0**2+TEM4**2)
            744 0036E    878  2 3C00002C            STA    TEM+2
            745 00370    880  2 7C00002A            STB    TEM
            746 00372    882  2 14000038            LDA    TEM4+2
            747 00374    884  2 630A                JL     IIM2A
GENERATED                           0700
            748 00376    886  2 1400001C            LDA    ZERO
            749 00378    888  2 5400001C            LDB    ZERO
            750 0037A    890  2 DC00002A            SFD    TEM          INVERT SIGN OF TEM
            751 0037C    892  2 6006                JU     IIM2B
GENERATED                           0700
            752 0037E    894  2 1400002C IIM2A      LDA    TEM+2
```

VERSION K20A0503 DECK NAME=*ALIGN *

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
          753 00380    896  2 5400002A          LDB    TEM
          754 00382    898  2 3C000048 IIM2B    STA    SY+2        SY=-SIGN(TEM4)*SQRT(TEM0**2+TEM4**2)
          755 00384    900  2 7C000046          STB    SY
          756 00386    902  2 1400001C          LDA    ZERO
          757 00388    904  2 3C000040          STA    ACM+2       ACM=0
          758 0038A    906  2 3C00003E          STA    ACM
          759 0038C    908  2 64040390          JS     IIM3
          760 0038E    910  2 74000008          RTA    IIMM
```

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VERSION K20A0503     DECK NAME=*ALIGN *                                                          PAGE  20

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
             762                                      ENTRY  IIM3
             763                                      EVEN
                                             *
                                             *    IIM3 COMPUTES SWT AND CWT
                                             *
             764 00390    912  2 0000000A IIM3    PTR    IIM3M
             765 00392    914  2 5C220010         LDX    4,WOPP,M
             766 00394    916  2 1400002C         LDA    NCCU+2
             767 00396    918  2 5400002A         LDB    NCCU
             768 00398    920  2 64040000         JS     MULFD            (WOPP*NCCUD)
             769 0039A    922  2 64040000         JS     SINCOS
             770 0039C    924  2 6004             JRU    *+4
GENERATED                            0700
             771 0039E    926  2 00000000         PTR    SWT              SWT=SIN(WOPP*NCCU)
             772 003A0    928  2 3C000006         STA    CWT+2
             773 003A2    930  2 7C000004         STB    CWT              CWT=COS(WOPP*NCCU)
             774 003A4    932  2 7400000A         RTA    IIM3M
```

```
VERSION K20A0503      DECK NAME=*ALIGN *                                                                          PAGE  21

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
            776                                          EVEN
            777                                          ENTRY  II0
                                                  *
                                                  *   LEAST SQUARES SOLUTION
                                                  *
            778 003A6    934  2 0000000C II0        PTR     II0M
                                                  *
                                                  *   COMPUTE OFFSET FOR MATRIX LSSC
                                                  *
            779 003A8    936  2 34000018 II01       LAE     LSSC
            780 003AA    938  2 3C00002A            STA     TEM
            781 003AC    940  2 14000028            LDA     MCSI
            782 003AE    942  2 04020024            MUL     36,M             MULTIPLY MCSI BY OFFSET CONSTANT
            783 003B0    944  2 0500                EAB
            784 003B1    945  2       0861          SRLD    1                GIVES AN INTEGER MULTIPLE
            785 003B2    946  2 A400002A            ADD     TEM
            786 003B4    948  2 06C0                LXA     8                (XR8)=ADDRESS OF LSSC(MCSI)
                                                  *
                                                  *   XA,XB,XC,AND YA,YB,YC ARE IN CONTIGUOUS LOCATIONS OF CORE
                                                  *
GENERATED                              0700
            787 003B6    950  2 5C4A0002            LDX     9,2,M
            788 003B8    952  2 5C1A002E            LDX     3,XA,M
            789 003BA    954  2 5C2A0046            LDX     5,YA,M
            790 003BC    956  2 5EA20000 II01A      LDX     4,0,5,M          (XR4)=ADDRESS OF YA(1)
            791 003BE    958  2 14400002            LDA     2,8
            792 003C0    960  2 54400000            LDB     0,8
            793 003C2    962  2 64040000            JS      MULFD            A(1,1)*YA(1)
            794 003C4    964  2 3981                 STA     2,3
            795 003C5    965  2       7980          STB     0,3
            796 003C6    966  2 5EA20004            LDX     4,4,5,M          (XR4)=ADDRESS OF YA(2)
            797 003C8    968  2 14400006            LDA     6,8
            798 003CA    970  2 54400004            LDB     4,8
            799 003CC    972  2 64040000            JS      MULFD            A(1,2)*YA(2)
            800 003CE    974  2 9980                AFD     0,3
            801 003CF    975  2       3981          STA     2,3              XA(1)=A(1,1)*YA(1)+A(1,2)*YA(2)
            802 003D0    976  2 7980                STB     0,3
GENERATED                              0700
            803 003D2    978  2 5EA20000            LDX     4,0,5,M          (XR4)=ADDRESS OF YA(1)
            804 003D4    980  2 14400006            LDA     6,8
            805 003D6    982  2 54400004            LDB     4,8
            806 003D8    984  2 64040000            JS      MULFD            A(2,1)*YA(1)8...A(1,2)=A(2,1)
            807 003DA    986  2 3983                STA     6,3
            808 003DB    987  2       7982          STB     4,3
            809 003DC    988  2 5EA20004            LDX     4,4,5,M          (XR4)=ADDRESS OF YA(2)
            810 003DE    990  2 1440000A            LDA     10,8
            811 003E0    992  2 54400008            LDB     8,8
            812 003E2    994  2 64040000            JS      MULFD            A(2,2)*YA(2)
            813 003E4    996  2 9982                AFD     4,3
            814 003E5    997  2       3983          STA     6,3              XA(2)=A(2,1)*YA(1)+A(2,2)*YA(2)
            815 003E6    998  2 7982                STB     4,3
                                                  *
                                                  *   INCREMENT REGISTERS FOR NEXT PASS THROUGH LOOP
                                                  *
```

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VERSION K20A0503     DECK NAME=*ALIGN *                                                    PAGE  22

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
GENERATED                            0700
           816 003E8   1000  2 6C1A0008         IMP    3,8,M
           817 003EA   1002  2 6C2A0008         IMP    5,8,M
           818 003EC   1004  2 6C42000C         IMP    8,12,M
           819 003EE   1006  2 6C480001         IMN    9,1,M
           820 003F0   1008  2 643003BC         JGU    II01A
           821 003F2   1010  2 5C22000C II02    LDX    4,AK1T,M
           822 003F4   1012  2 14000044         LDA    XC+6
           823 003F6   1014  2 54000042         LDB    XC+4
           824 003F8   1016  2 64040000         JS     DVFD        XC(2)/AK1T
           825 003FA   1018  2 3C000044         STA    SX+2
           826 003FC   1020  2 7C000042         STB    SX          SX=XC(2)/AK1T
           827 003FE   1022  2 1400001C         LDA    ZERO
           828 00400   1024  2 5400001C         LDB    ZERO
           829 00402   1026  2 DC000032         SFD    XA+4        XA(2)=-XA(2)
           830 00404   1028  2 64040000         JS     DVFD        -XA(2)/AK1T
           831 00406   1030  2 3C00004C         STA    SZ+2
           832 00408   1032  2 7C00004A         STB    SZ          SZ=-XA(2)/AK1T
           833 0040A   1034  2 1400001C         LDA    ZERO
           834 0040C   1036  2 5400001C         LDB    ZERO
           835 0040E   1038  2 DC00003E         SFD    XC          XC(1)=-XC(1)
           836 00410   1040  2 64040000         JS     DVFD        -XC(1)/AK1T
           837 00412   1042  2 3C000048         STA    SY+2
           838 00414   1044  2 7C000046         STB    SY          SY=-XC(1)/AK1T
           839 00416   1046  2 5C2A000A         LDX    5,10,M
           840 00418   1048  2 5C220014         LDX    4,DF8,M
           841 0041A   1050  2 16800042 II02A   LDA    SX,5
           842 0041C   1052  2 56800040         LDB    SX-2,5
           843 0041E   1054  2 64040000         JS     MULFD       SX=SX*8.0
           844 00420   1056  2 3E800042         STA    SX,5        SY=SY*8.0
           845 00422   1058  2 7E800040         STB    SX-2,5      SZ=SZ*8.0
           846 00424   1060  2 6C280004         IMN    5,4,M
           847 00426   1062  2 6430041A         JGU    II02A
           848 00428   1064  2 5C22002A         LDX    4,NCCU,M
           849 0042A   1066  2 14000026         LDA    SRA+2
           850 0042C   1068  2 54000024         LDB    SRA
           851 0042E   1070  2 64040000         JS     DVFD        SRA/NCCU
           852 00430   1072  2 3C000040         STA    ACM+2
           853 00432   1074  2 7C00003E         STB    ACM         ACM=SRA/NCCU
           854 00434   1076  2 5C22000C         LDX    4,CGDL,M
           855 00436   1078  2 1400004C         LDA    SZ+2
           856 00438   1080  2 5400004A         LDB    SZ
           857 0043A   1082  2 64040000         JS     MULFD       SZ*CGDL
           858 0043C   1084  2 3C000030         STA    TEM0+2
           859 0043E   1086  2 7C00002E         STB    TEM0
           860 00440   1088  2 5C220062         LDX    4,VTC,M
           861 00442   1090  2 14000038         LDA    XB+2
           862 00444   1092  2 54000036         LDB    XB
           863 00446   1094  2 64040000         JS     DVFD        XB(1)/VT
           864 00448   1096  2 3C000034         STA    TEM2+2
           865 0044A   1098  2 7C000032         STB    TEM2
           866 0044C   1100  2 5C220008         LDX    4,SGDL,M
           867 0044E   1102  2 14000044         LDA    SX+2
           868 00450   1104  2 54000042         LDB    SX
           869 00452   1106  2 64040000         JS     MULFD       SX*SGDL
```

VERSION K20A0503 DECK NAME=*ALIGN *

DIAGNOSTICS	LINE	ADRES	DADRES	LC	PROGRAM			SOURCE
	870	00454	1108	2	3C000038	STA	TEM4+2	
	871	00456	1110	2	7C000036	STB	TEM4	
	872	00458	1112	2	14000030	LDA	TEM0+2	
	873	0045A	1114	2	5400002E	LDB	TEM0	
	874	0045C	1116	2	DC000032	SFD	TEM2	SZ*CGDL-XB(1)/VT
	875	0045E	1118	2	DC000036	SFD	TEM4	SZ*CGDL-XB(1)/VT-SX*SGDL
	876	00460	1120	2	3C000030	STA	TEM0+2	
	877	00462	1122	2	7C00002E	STB	TEM0	
	878	00464	1124	2	64040000	JS	MULFD	SGDL*(SZ*CGDL-XB(1)/VT-SX*SGDL)
	879	00466	1126	2	9C000042	AFD	SX	
	880	00468	1128	2	3C000044	STA	SX+2	SX=SX+SGDL*(SZ*CGDL-XB(1)/VT-SX*SGDL)
	881	0046A	1130	2	7C000042	STB	SX	
	882	0046C	1132	2	5C22000C	LDX	4,CGDL,M	
	883	0046E	1134	2	14000030	LDA	TEM0+2	
	884	00470	1136	2	5400002E	LDB	TEM0	
	885	00472	1138	2	64040000	JS	MULFD	CGDL*(SZ*CGDL-XB(1)/VT-SX*SGDL)
	886	00474	1140	2	3C000030	STA	TEM0+2	
	887	00476	1142	2	7C00002E	STB	TEM0	
	888	00478	1144	2	1400004C	LDA	SZ+2	
	889	0047A	1146	2	5400004A	LDB	SZ	
	890	0047C	1148	2	DC00002E	SFD	TEM0	
	891	0047E	1150	2	3C00004C	STA	SZ+2	SZ=SZ-CGDL*(SZ*CGDL-XB(1)/VT-SX*SGDL)
	892	00480	1152	2	7C00004A	STB	SZ	
	893	00482	1154	2	64040390	JS	IIM3	
	894	00484	1156	2	7400000C	RTA	IIOM	

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                SOURCE
                                    *
                                    *    COMPUTE DELTA A MATRIX AND DELTA AJ MATRIX
                                    *    (SUBROUTINES COM AND CDAM)
                                    *
  896                                      ENTRY  IIP
  897                                      EVEN
  898 00486   1158  2 0000000E IIP      PTR    IIPM
  899 00488   1160  2 5C2A000A IIP1     LDX    5,10,M
  900 0048A   1162  2 5EA20040 IIP1A    LDX    4,SX-2,5,M
  901 0048C   1164  2 16800042          LDA    SX,5
  902 0048E   1166  2 56800040          LDB    SX-2,5
  903 00490   1168  2 64040000          JS     MULFD          SX(I)**2    I=1,3
  904 00492   1170  2 3E80002E          STA    TEM0,5
  905 00494   1172  2 7E80002C          STB    TEM0-2,5
  906 00496   1174  2 1400001E          LDA    FONE
  907 00498   1176  2 5400001C          LDB    ZERO
  908 0049A   1178  2 DE80002C          SFD    TEM0-2,5       (1.0-SX(I)**2)
  909 0049C   1180  2 64040000          JS     DECSQ          SQRT(1.0-SX(I)**2)
  910 0049E   1182  2 3E80002E          STA    TEM0,5
  911 004A0   1184  2 7E80002C          STB    TEM0-2,5       TEM0=SQRT(1.0-SX(I)**2)
  912 004A2   1186  2 6C2B0004          IMN    5,4,M
  913 004A4   1188  2 6430048A          JGU    IIP1A
  914 004A6   1190  2 5C2A012C IIP2     LDX    5,TM,M
  915 004A8   1192  2 1400001C          LDA    ZERO
  916 004AA   1194  2 3A8C              STA    24,5           TM(1,3)=TM(2,3)=TM(3,1)=TM(3,2)=0
  917 004AB   1195  2      3A8D         STA    26,5
  918 004AC   1196  2 3A8E              STA    28,5
  919 004AD   1197  2      3A8F         STA    30,5
  920 004AE   1198  2 3A84              STA    8,5
  921 004AF   1199  2      3A85         STA    10,5
  922 004B0   1200  2 3A8A              STA    20,5
  923 004B1   1201  2      3A8B         STA    22,5
  924 004B2   1202  2 5400001E          LDB    FONE
  925 004B4   1204  2 3A90              STA    32,5
  926 004B5   1205  2      7A91         STB    34,5           TM(3,3)=1.0
  927 004B6   1206  2 14000038          LDA    TEM4+2
  928 004B8   1208  2 54000036          LDB    TEM4
  929 004BA   1210  2 3A81              STA    2,5
  930 004BB   1211  2      7A80         STB    0,5
  931 004BC   1212  2 3A89              STA    18,5           TM(1,1)=TM(2,2)=TEM4
  932 004BD   1213  2      7A88         STB    16,5
  933 004BE   1214  2 1400004C          LDA    SZ+2
  934 004C0   1216  2 5400004A          LDB    SZ
  935 004C2   1218  2 3A87              STA    14,5           TM(1,2)=SZ
  936 004C3   1219  2      7A86         STB    12,5
  937 004C4   1220  2 1400001C          LDA    ZERO
  938 004C6   1222  2 5400001C          LDB    ZERO
  939 004C8   1224  2 DC00004A          SFD    SZ             SZ=-SZ
  940 004CA   1226  2 3A83              STA    6,5
  941 004CB   1227  2      7A82         STB    4,5            TM(2,1)=-SZ
  942 004CC   1228  2 5C2A0150          LDX    5,TM1,M
  943 004CE   1230  2 1400001C          LDA    ZERO
  944 004D0   1232  2 3A86              STA    12,5           TM1(1,2)=TM1(2,1)=TM1(3,2)=TM1(2,3)=0
  945 004D1   1233  2      3A87         STA    14,5
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VERSION K20A0503      DECK NAME=*ALIGN *                                                                  PAGE  25

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                         SOURCE
            946 004D2   1234  2 3A82             STA    4.5
            947 004D3   1235  2      3A83        STA    6.5
            948 004D4   1236  2 3A8A             STA    20.5
            949 004D5   1237  2      3A8B        STA    22.5
            950 004D6   1238  2 3A8E             STA    28.5
            951 004D7   1239  2      3A8F        STA    30.5
            952 004D8   1240  2 5400001E         LDB    FONE
            953 004DA   1242  2 3A88             STA    16.5
            954 004DB   1243  2      7A89        STB    18.5          TM1(2,2)=1.0
            955 004DC   1244  2 14000034         LDA    TEM2+2
            956 004DE   1246  2 54000032         LDB    TEM2
            957 004E0   1248  2 3A81             STA    2.5           TM1(1,1)=TM1(3,3)=TEM2
            958 004E1   1249  2      7A80        STB    0.5
            959 004E2   1250  2 3A91             STA    34.5
            960 004E3   1251  2      7A90        STB    32.5
            961 004E4   1252  2 14000048         LDA    SY+2
            962 004E6   1254  2 54000046         LDB    SY
            963 004E8   1256  2 3A85             STA    10.5          TM1(3,1)=SY
            964 004E9   1257  2      7A84        STB    8.5
            965 004EA   1258  2 1400001C         LDA    ZERO
            966 004EC   1260  2 5400001C         LDB    ZERO
            967 004EE   1262  2 DC000046         SFD    SY            SY=-SY
            968 004F0   1264  2 3A8D             STA    26.5          TM1(1,3)=-SY
            969 004F1   1265  2      7A8C        STB    24.5
            970 004F2   1266  2 64040000         JS     MUL33         D1(I,J)=TM(I,J)*TM1(I,J)
            971 004F4   1268  2 6008             JRU    *+8
GENERATED                            0700
            972 004F6   1270  2 0000012C         PTR    TM
            973 004F8   1272  2 00000150         PTR    TM1
            974 004FA   1274  2 00000054         PTR    D1
            975 004FC   1276  2 5C2A012C         LDX    5,TM,M
            976 004FE   1278  2 1400001C         LDA    ZERO
            977 00500   1280  2 3A86             STA    12.5          TM(1,2)=TM(1,3)=TM(2,1)=TM(3,1)=0
            978 00501   1281  2      3A87        STA    14.5
            979 00502   1282  2 3A8C             STA    24.5
            980 00503   1283  2      3A8D        STA    26.5
            981 00504   1284  2 3A82             STA    4.5
            982 00505   1285  2      3A83        STA    6.5
            983 00506   1286  2 3A84             STA    8.5
            984 00507   1287  2      3A85        STA    10.5
            985 00508   1288  2 5400001E         LDB    FONE
            986 0050A   1290  2 3A80             STA    0.5
            987 0050B   1291  2      7A81        STB    2.5           TM(1,1)=1.0
            988 0050C   1292  2 14000030         LDA    TEM0+2
            989 0050E   1294  2 5400002E         LDB    TEM0
            990 00510   1296  2 3A89             STA    18.5          TM(2,2)=TM(3,3)=TEM0
            991 00511   1297  2      7A88        STB    16.5
            992 00512   1298  2 3A91             STA    34.5
            993 00513   1299  2      7A90        STB    32.5
            994 00514   1300  2 14000044         LDA    SX+2
            995 00516   1302  2 54000042         LDB    SX
            996 00518   1304  2 3A8F             STA    30.5
            997 00519   1305  2      7A8E        STB    28.5          TM(2,3)=SX
            998 0051A   1306  2 1400001C         LDA    ZERO
            999 0051C   1308  2 5400001C         LDB    ZERO
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VERSION K20A0503      DECK NAME=*ALIGN *                                                                PAGE  26

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
            1000 0051E   1310  2 DC000042          SFD    SX              SX=-SX
            1001 00520   1312  2 3A8B              STA    22,5
            1002 00521   1313  2     7A8A          STB    20,5            TM(3,2)=-SX
            1003 00522   1314  2 64040000          JS     MUL33           A(I,J)=D1(I,J)*TM(I,J)
            1004 00524   1316  2 6008              JRU    *+8
GENERATED                            0700
            1005 00526   1318  2 00000054          PTR    D1
            1006 00528   1320  2 0000012C          PTR    TM
            1007 0052A   1322  2 0000000C          PTR    A
            1008 0052C   1324  2 640405AC IIP3     JS     IIRS            SETS UP D(I,J)
            1009 0052E   1326  2 64040000          JS     MUL33           TM(I,J)=D(I,J)*A(I,J)
            1010 00530   1328  2 6008              JRU    *+8
GENERATED                            0700
            1011 00532   1330  2 000000E4          PTR    D
            1012 00534   1332  2 0000000C          PTR    A
            1013 00536   1334  2 0000012C          PTR    TM
            1014 00538   1336  2 64040000          JS     MUL33           D1(I,J)=TM(I,J)*AJ(I,J)
            1015 0053A   1338  2 6008              JRU    *+8
GENERATED                            0700
            1016 0053C   1340  2 0000012C          PTR    TM
            1017 0053E   1342  2 000000F2          PTR    AJ
            1018 00540   1344  2 00000054          PTR    D1
            1019 00542   1346  2 5C2A0022          LDX    5,34,M
            1020 00544   1348  2 16800054 IIP3B    LDA    D1,5            AJ(I,J)=D1(I,J)
            1021 00546   1350  2 3E8000F2          STA    AJ,5
            1022 00548   1352  2 6C2B0002          IMN    5,2,M
            1023 0054A   1354  2 64300544          JGU    IIP3B
            1024 0054C   1356  2 640405D6          JS     ALNO            CALL ALIGN OUTPUT ROUTINE
            1025 0054E   1358  2 7400000E          RTA    IIPM
```

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
                                        *
                                        *          SUBROUTINE GTND (GO TO NAV DECISION)
                                        *
                                        *     THIS ROUTINE IS EXECUTED ONCE EVERY 1/8 SECOND DURING ALIGN.
                                        *     THE DECISION TO ENABLE NAV IS BASED ON TWO CRITERIA.
                                        *       1. NAV MUST BE THE SELECTED SYSTEM MODE.
                                        *       2. AN ADEQUATE AJ MATRIX MUST BE AVAILABLE,WHICH IS ONLY
                                        *          WHEN FINE ALIGN HAS BEEN COMPLETED (NMO.GE.8)
                                        *
                                        *
          1027                                ENTRY    IIR
          1028                                EVEN
          1029 00550   1360  2 0000001U IIR   PTR    IIRM
          1030 00552   1362  2 1400000B IIR1  LDA    NONE
          1031 00554   1364  2 3C000036       STA    ASCH          ASCH=-1
                                        **********************
                                        *
                                        *    DPU PROCESSING - NOT IMPLEMENTED
                                        *
                                        **********************
          1032 00556   1366  2 1400006C       LDA    MODE
          1033 00558   1368  2 E4000010       SBU    FOUR
          1034 0055A   1370  2 6104           JRN    IIR1A
GENERATED                          0700
          1035 0055C   1372  2 74000010       RTA    IIRM          MODE=4 RETURN TO BACKGROUND
                                        *                           IN AIR ALIGN...NOT IMPLEMENTED
          1036 0055E   1374  2 6304     IIR1A JRL    IIR1B
GENERATED                            0700
          1037 00560   1376  2 74000010       RTA    IIRM          MODE>4 RETURN TO BACKGROUND
                                        *                           GROUND ALIGN
          1038 00562   1378  2 14000030 IIR1B  LDA    FLGN          MODE<4
          1039 00564   1380  2 6110           JRN    IIR2
GENERATED                            0700
          1040 00566   1382  2 5C28002C       LDX    5,NMO
          1041 00568   1384  2 242B0008       ICL    5,8,M         CHECK FOR NMO > 7
          1042 0056A   1386  2 6430056E       JGU    IIR1C
          1043 0056C   1388  2 74000010       RTA    IIRM          NMO .LE. 7. RETURN TO BACKGROUND
          1044 0056E   1390  2 1400000A IIR1C  LDA    ONE
          1045 00570   1392  2 3C000070       STA    TMPR          TMPR=1
          1046 00572   1394  2 600C           JU     IIR3
GENERATED                            0700
          1047 00574   1396  2 5C2A0022 IIR2   LDX    5,34,M
          1048 00576   1398  2 16B0010B IIR2A  LDA    SA,5          AJ(I,J)=SA(I,J)
          1049 00578   1400  2 3E8000F2       STA    AJ,5
          1050 0057A   1402  2 6C2B0002       IMN    5,2,M
          1051 0057C   1404  2 64300576       JGU    IIR2A
          1052 0057E   1406  2 1400005A IIR3   LDA    TIME+2
          1053 00580   1408  2 54000058       LDB    TIME
          1054 00582   1410  2 DC000032       SFD    SAVT          TIME-SAVT
          1055 00584   1412  2 5C220028       LDX    4,OMEG,M
          1056 00586   1414  2 64040000       JS     MULFD         OMEG*(TIME-SAVT)
          1057 00588   1416  2 64040000       JS     SINCOS
          1058 0058A   1418  2 6004           JRU    *+4
GENERATED                            0700
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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            1059 0058C   1420  2 00000000          PTR    SWT      SWT=SIN(OMEG*(TIME-SAVT))
            1060 0058E   1422  2 3C000006          STA    CWT+2
            1061 00590   1424  2 7C000004          STB    CWT      CWT=COS(OMEG*(TIME-SAVT))
            1062 00592   1426  2 640405AC          JS     IIR5
            1063 00594   1428  2 64040000 IIR6     JS     MUL33    D1(I,J)=D(I,J)*AJ(I,J)
            1064 00596   1430  2 6008              JRU    *+8
GENERATED                            0700
            1065 00598   1432  2 000000E4          PTR    D
            1066 0059A   1434  2 000000F2          PTR    AJ
            1067 0059C   1436  2 00000054          PTR    D1
            1068 0059E   1438  2 5C2A0022          LDX    5,34,M
            1069 005A0   1440  2 16H00054 IIR6A    LDA    D1,5     AJ(I,J)=D1(I,J)
            1070 005A2   1442  2 3E8000F2          STA    AJ,5
            1071 005A4   1444  2 6C280002          IMN    5,2,M
            1072 005A6   1446  2 643005A0          JGU    IIR6A
                                                  **********
                                                  *
                                                  *    DOPPLER PROCESSING - NOT IMPLEMENTED
                                                  *
                                                  **********
            1073 005A8   1448  2 64040000          JS     NAVI     INITIALIZE FOR NAVIGATION
            1074 005AA   1450  2 74000010          RTA    IIRM
```

VERSION K20A0503 DECK NAME=*ALIGN *

DIAGNOSTICS LINE ADRES DADRES LC PROGRAM SOURCE

```
                                        *
                                        *    SUBROUTINE IIR5 SETS UP MATRIX D TO PRE MULTIPLY MATRIX AJ
                                        *
1076                                    ENTRY   IIR5
1077                                    EVEN
1078 005AC   1452  2 00000012 IIR5      PTR     IIR5M
1079 005AE   1454  2 5C2A00E4           LDX     5,0,M
1080 005B0   1456  2 1400001C           LDA     ZERO
1081 005B2   1458  2 3A8C               STA     24,5        D(1,3)=D(2,3)=D(3,1)=D(3,2)=0
1082 005B3   1459  2      3A8D          STA     26,5
1083 005B4   1460  2 3A8E               STA     28,5
1084 005B5   1461  2      3A8F          STA     30,5
1085 005B6   1462  2 3A84               STA     8,5
1086 005B7   1463  2      3A85          STA     10,5
1087 005B8   1464  2 3A8A               STA     20,5
1088 005B9   1465  2      3A8B          STA     22,5
1089 005BA   1466  2 5400001E           LDB     ONE
1090 005BC   1468  2 3A90               STA     32,5
1091 005BD   1469  2      7A91          STB     34,5        D(3,3)=1.0
1092 005BE   1470  2 14000006           LDA     CWT+2
1093 005C0   1472  2 54000004           LDB     CWT
1094 005C2   1474  2 3A81               STA     2,5         D(1,1)=D(2,2)=CWT
1095 005C3   1475  2      7A80          STB     0,5
1096 005C4   1476  2 3A89               STA     18,5
1097 005C5   1477  2      7A88          STB     16,5
1098 005C6   1478  2 14000002           LDA     SWT+2
1099 005C8   1480  2 54000000           LDB     SWT
1100 005CA   1482  2 3A87               STA     14,5
1101 005CB   1483  2      7A86          STB     12,5        D(1,2)=SWT
1102 005CC   1484  2 1400001C           LDA     ZERO
1103 005CE   1486  2 5400001C           LDB     ZERO
1104 005D0   1488  2 DC000000           SFD     SWT         SWT=-SWT
1105 005D2   1490  2 3A83               STA     6,5         D(2,1)=-SWT
1106 005D3   1491  2      7A82          STB     4,5
1107 005D4   1492  2 74000012           RTA     IIR5M
```

```
VERSION K20A0503      DECK NAME=*ALIGN *

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
                                          *
                                          *   ALIGNMENT OUTPUT ROUTINE , ALNO
                                          *
     1109                                         ENTRY  ALNO
     1110                                         EVEN
     1111 005D6   1494  2 00000014 ALNO           PTR    ALNOR
     1112 005D8   1496  2 14005100                LDA    DECFLG       INCREMENT PDP-11 FLAG
     1113 005DA   1498  2 A400000A                ADD    ONE
     1114 005DC   1500  2 3C005100                STA    DECFLG
     1115 005DE   1502  2 1400005A                LDA    TIME+2
     1116 005E0   1504  2 54000058                LDB    TIME
     1117 005E2   1506  2 3C005104                STA    BTIME+2      PUT TIME IN BUFFER
     1118 005E4   1508  2 7C005102                STB    BTIME
     1119 005E6   1510  2 5C2A000A                LDX    5,10,M
     1120 005E8   1512  2 16800042 ALNO1          LDA    SX,5
     1121 005EA   1514  2 3E805106                STA    BSX,5        PUT SX,SY, AND SZ IN BUFFER
     1122 005EC   1516  2 6C2B0002                IMN    5,2,M
     1123 005EE   1518  2 643005E8                JGU    ALNO1
     1124 005F0   1520  2 5C2A0022                LDX    5,34,M
     1125 005F2   1522  2 168000F2 ALNO2          LDA    AJ,5
     1126 005F4   1524  2 3E805112                STA    BAJ,5        PUT MATRIX AJ IN BUFFER
     1127 005F6   1526  2 6C2B0002                IMN    5,2,M
     1128 005F8   1528  2 643005F2                JGU    ALNO2
     1129 005FA   1530  2 0700                    NOP                 FILL WORD FOR POSSIBLE OTHER DATA
     1130 005FB   1531  2     0700                NOP
     1131 005FC   1532  2 0700                    NOP
     1132 005FD   1533  2     0700                NOP
     1133 005FE   1534  2 1400002C                LDA    NMO
     1134 00600   1536  2 3C005136                STA    BNMO         PUT NMO IN BUFFER
     1135 00602   1538  2 74000014                RTA    ALNOR
     1136                                         END
```

STATISTICS

TOTAL SHORTS 120
TOTAL LONGS 612
TOTAL INSTRUCTIONS 732
PERCENT SHORT 16.4
GENERATED NOPS 24
THEORETICAL PERCENT NOP LOADING 7.8
ACTUAL PERCENT NOP LOADING 2.0

```
DECK NAME=*ALIGN *          *****ERROR MESSAGES*****

 LINE NUMBER                DIAGNOSTIC
 1   197.....ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
 2   371.....ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
```

XREF 1 DECK NAME=*ALIGN * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 1

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES					
0000C	12		5	A	114	115	1007	1012			
0003E	62		1	ACM	318	698	699	757	758	852	853
000F2	242		4	AJ	109	1017	1021	1049	1066	1070	1125
0000C	12		8	AK1T	166	519	659	821			
00010	16		8	AK2T	167	530	531				
00014	20		1	ALNOR	307	1111	1135				
005E8	1512		2	ALNO1	1120	1123					
005F2	1522		2	ALNO2	1125	1128					
00506	1494		2	ALNO	1111	1024	1109				
00010	16		7	ALT	126						
00150	336		7	AP	155						
00036	54		5	ASCH	118	119	374	376	1031		
0015C	348		7	AT	156						
05112	20754		13	BAJ	294	1126					
05136	20790		13	BNMO	295	1134					
05106	20742		13	BSX	293	1121					
00030	48		4	BTE1	17						
00032	50		4	BTE3	18						
05102	20738		13	BTIME	292	1117	1118				
05100	20736			BUFORG	1	290					
0003C	60		9	CD01	222						
00040	64		9	CD02	223						
00044	68		9	CD03	224						
00038	56		5	CD04D	120						
00048	72		9	CD04	225						
0004C	76		9	CD05	226						
00050	80		9	CD06	227						
00054	84		9	CD07	228						
00058	88		9	CD08	229						
0005C	92		9	CD09	230						
00060	96		9	CD10	231						
00064	100		9	CD11	232						
00068	104		9	CD12	233						
0006C	108		9	CD13	234						
00070	112		9	CD14	235						
00074	116		9	CD15	237						
00078	120		9	CD16	238						
0007C	124		9	CD17	239						
00080	128		9	CD18	240						
00084	132		9	CD19	241						
00088	136		9	CD20	242						
0008C	140		9	CD21	243						
00090	144		9	CD22	244						
00094	148		9	CD23	245						
00098	152		9	CD24	246						
0009C	156		9	CD25	247						
000A0	160		9	CD26	248						
000A4	164		9	CD27	249						
000A8	168		9	CD28	250						
000AC	172		9	CD29	251						
000B0	176		9	CD30	252						
000B4	180		9	CD31	253						
000B8	184		9	CD32	254						

XREF 1 DECK NAME=*ALIGN * SRC 2000 CROSS REFERENCE DICTIONARY PAGE 2

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES							
000BC	188		9	CD33	255								
000C0	192		9	CD34	256								
000C4	196		9	CD35	257								
000C8	200		9	CD36	258								
000CC	204		9	CD37	259								
000D0	208		9	CD38	260								
000D4	212		9	CD39	261								
000D8	216		9	CD40	263								
000DC	220		9	CD41	264								
000E0	224		9	CD42	265								
000E4	228		9	CD43	266								
000E8	232		9	CD44	267								
000EC	236		9	CD45	268								
000F0	240		9	CD46	269								
000F4	244		9	CD47	270								
000F8	248		9	CD48	271								
000FC	252		9	CD49	272								
00100	256		9	CD50	273								
00104	260		9	CD51	274								
00108	264		9	CD52	275								
0010C	268		9	CD53	276								
00110	272		9	CD54	277								
00114	276		9	CD55	278								
00118	280		9	CD56	279								
0011C	284		9	CD57	280	281							
00120	288		9	CD58	282								
00124	292		9	CD59	283								
00128	296		9	CD60	284								
0012C	300		9	CD61	285								
00130	304		9	CD62	286								
00134	308		9	CD63	287								
00138	312		9	CD64	288								
0000C	12		7	CGUL	125	163	717	718	854	882			
00038	56		4	CIPM	21								
0000C	12		7	CL	163								
00000	0		9	CONCO4	194								
00016	22		1	CTHR	308	517	518	520	521	608			
00052	82		4	CTR1	31								
00054	84		4	CTR2	32								
00056	86		4	CTR3	33								
00004	4		7	CWT	123	691	692	772	773	1060	1061	1092	1093
0004A	74		4	CYLE	27								
0002E	46		7	C1	133								
00032	50		7	C2	134								
00036	54		7	C3	135								
0003A	58		7	C4	136								
000E4	228		7	D	150	157	1011	1065	1079				
00066	102		4	DATA	39								
0000C	12		5	DCAM	115								
00002	2		4	DCSK	197								
05100	20736		13	DECFLG	291	1112	1114						
*****UNDEFINED*****				DECSO		565	679	743	909				
00030	48		9	DELT	218	534	620						

XREF 1 DECK NAME=*ALIGN * SRC 2000 CROSS REFERENCE DICTIONARY PAGE 3

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES										
0001C	28	9		DFONE	212	387										
00014	20	2		DF6	331	840										
00078	120	7		DG	145											
00024	36	4		DPDV	14											
00028	40	4		DPHV	15											
0003A	58	1		DPTO	317	572	573	574	586							
00020	32	4		DPVV	13											
0004E	78	4		DRFV	29											
*****UNDEFINED*****				DVFD		571	662	667	685	690	711	824	830	836	851	863
0003E	62	4		DVX	24	555	556	557	576	577	641	646	647			
00014	20	4		DVXG	10											
00000	0	5		DVXI	111	426	427	454	455	483	484	495	496	636		
00042	66	4		DVY	25											
00018	24	4		DVYG	11											
00004	4	5		DVYJ	112											
00046	70	4		DVZ	26											
0001C	28	4		DVZG	12											
00008	8	5		DVZK	113											
00054	84	7		D1	144	159	974	1005	1018	1020	1067	1069				
00034	52	9		D1032	219											
00038	56	9		D3032	220											
00016	22	9		EIGHT	207											
0009C	156	7		E1	146											
000A8	168	7		E2	147											
000B4	180	7		E3	148											
0000C	12	2		FKC	328	452										
00008	8	2		FKF	327	424										
00030	48	5		FLGN	116	1038										
0001E	30	9		FONE	211	584	906	924	952	985	1089					
00010	16	9		FOUR	204	478	1033									
0002C	44	4		GMT	16											
00050	80	4		HDGV	30											
00000	0	8		IACOM	164											
000A8	168	2		IIA	371	370										
00000	0	1		IIAM	297	371	396	398	417	419						
000BA	186	2		IIA1A	381	380										
000AA	170	2		IIA1	372											
000C2	194	2		IIA2	385	381										
000DA	218	2		IIA3	397	382										
000EC	236	2		IIA4A	407	406										
000F2	242	2		IIA4H	410	407										
000F6	246	2		IIA4C	412	408										
000FA	250	2		IIA4D	414	409										
000FC	252	2		IIA4E	415	411	413									
000DE	222	2		IIA4	399	383										
00104	260	2		IIA5A	419	377	402									
00102	258	2		IIA5	418	384										
*****UNDEFINED*****				IIC		393										
00106	262	2		IID	423	394	421									
00002	2	1		IIDM	298	423	503									
0010C	268	2		IID1A	426	434										
00108	264	2		IID1	424											
00122	290	2		IID2A	437	448										

XREF 1 DECK NAME=*ALIGN * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 4

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES			
0011E	286		2	IID2	435				
0013A	314		2	IID3	449	447			
00144	324		2	IID4A	454	462			
00140	320		2	IID4	452				
0015A	346		2	IID5A	465	476			
00156	342		2	IID5	463				
0017A	378		2	IID6A	481	486			
00172	370		2	IID6	477	475			
00192	402		2	IID7A	493	498			
00190	400		2	IID7	492	451			
001A6	422		2	IID8	503	479	491		
*****UNDEFINED*****				IIE		395			
*****UNDEFINED*****				IIF		397			
*****UNDEFINED*****				IIG		399			
001A8	424		2	IIH	507	400	505		
00004	4		1	IIHM	299	507	631	643	654
001AA	426		2	IIH1	508				
001E2	482		2	IIH2A	536	542			
001C0	448		2	IIH2	519				
001F6	502		2	IIH3A	547	546			
001F0	496		2	IIH3	543				
0029E	670		2	IIJ	632	547			
0029E	670		2	IIJ1	633				
002C8	712		2	IIK	658	410	656		
00006	6		1	IIKM	300	658	702		
002CA	714		2	IIK2	659				
002E0	736		2	IIK3	670				
00312	786		2	IIK4A	695	697			
0030E	782		2	IIK4	693				
00284	692		2	IIL	644	548			
00286	694		2	IIL1	646	653			
00322	802		2	IIM	706	412	704		
00324	804		2	IIMI	707				
00008	8		1	IIMM	301	706	760		
00328	808		2	IIM1A	709	715			
0037E	894		2	IIM2A	752	747			
00382	898		2	IIM2B	754	751			
00336	822		2	IIM2	716				
0000A	10		1	IIM3M	302	764	774		
00390	912		2	IIM3	764	759	762	893	
001FC	508		2	IIN	550	549			
00206	518		2	IIN1A	556	564			
0022E	558		2	IIN1B	576	583			
001FC	508		2	IIN1	551				
003A6	934		2	IIO	778	414	777		
0000C	12		1	IIOM	303	778	894		
0038C	956		2	IIO1A	790	820			
003A8	936		2	IIO1	779				
00418	1050		2	IIO2A	841	847			
003F2	1010		2	IIO2	821				
00486	1158		2	IIP	898	415	896		
0000E	14		1	IIPM	304	898	1025		
00488	1162		2	IIP1A	900	913			

XREF 1 DECK NAME=*ALIGN * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 5

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
00488	1160		2	IIP1	899												
004A6	1190		2	IIP2	914												
00544	1348		2	IIP3B	1020	1023											
0052C	1324		2	IIP3	1008												
00550	1360		2	IIR	1029	418	1027										
00010	16		1	IIRM	305	1029	1035	1037	1043	1074							
0055E	1374		2	IIR1A	1036	1034											
00562	1378		2	IIR1B	1038	1036											
0056E	1390		2	IIR1C	1044	1042											
00552	1362		2	IIR1	1030												
00576	1398		2	IIR2A	1048	1051											
00574	1396		2	IIR2	1047	1039											
0057E	1406		2	IIR3	1052	1046											
00012	18		1	IIR5M	306	1078	1107										
005AC	1452		2	IIR5	1078	1008	1062	1076									
005A0	1440		2	IIR6A	1069	1072											
00594	1428		2	IIR6	1063												
00060	96		4	ITER	36												
000E4	228		7	J3X3	157												
0002C	44		9	KGDL	217												
0004E	78		7	KSN1	141												
00050	80		7	KSN2	142												
00052	82		7	KSN3	143												
00150	336		7	K3X3	158												
00024	36		7	LCA1	160												
00028	40		7	LCA4	161												
0006E	110		4	LITE	43												
00018	24		2	LSSC	332	779											
00054	84		7	L3X3	159												
00000	0		7	MATCOM	121												
00028	40		8	MCSI	174	781											
0006C	108		4	MODE	42	1032											
*****UNDEFINED*****				MULFD		429	440	457	468	512	522	527	538	558	578	598	604
						611	623	625	627	671	677	719	724	735	741	768	793
						799	806	812	843	857	869	878	885	903	1056		
*****UNDEFINED*****				MUL33		970	1003	1009	1014	1063							
00064	100		4	NAVF	38	373											
*****UNDEFINED*****				NAVI		1073											
00024	36		8	NCCD	172	390	392	401									
0002A	42		8	NCCU	175	385	386	388	389	509	510	621	622	766	767	848	
00004	4		9	NFOUR	198												
00000	0		5	NIACOM	110												
00018	24		9	NINE	208												
0002C	44		7	NMO	132	449	477	1040	1133								
00008	8		9	NONE	200	1030											
00036	54		5	NSCH	119												
00006	6		9	NT#0	199												
00000	0		9	N64	195												
000C0	192		7	OC	149												
00028	40		9	OMEG	216	1055											
00024	36		9	OMGA	215	626											
0000A	10		9	ONE	201	375	391	1044	1113								
00020	32		9	ONMLF	214	511											

XREF 1 DECK NAME=*ALIGN * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 6

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES
000AC	172	4	014		74
00094	148	4	018		62
000A4	164	4	021		70
000A6	166	4	022		71
000A2	162	4	023		69
000A8	168	4	024		72
000CA	202	4	025		89
00096	150	4	030		63
00098	152	4	031		64
0009A	154	4	032		65
0009C	156	4	033		66
0009E	158	4	034		67
000A0	160	4	035		68
00086	134	4	04A		55
00088	136	4	04B		56
0008A	138	4	04C		57
000B2	178	4	04D		77
000B4	180	4	04E		78
00072	114	4	04F		45
00074	116	4	040		46
00076	118	4	041		47
00078	120	4	042		48
0007A	122	4	043		49
0007C	124	4	044		50
0007E	126	4	045		51
0008C	140	4	046		58
00080	128	4	047		52
00082	130	4	048		53
00084	132	4	049		54
000D2	210	4	05A		93
000C4	196	4	05B		86
000C6	198	4	05D		87
000C8	200	4	05E		88
000B6	182	4	050		79
000B8	184	4	051		80
000BA	186	4	052		81
000BC	188	4	053		82
000BE	190	4	054		83
000C0	192	4	055		84
000C2	194	4	056		85
000D6	214	4	057		95
000D8	216	4	058		96
000DA	218	4	059		97
000EA	234	4	06A		105
000EC	236	4	06B		106
0008E	142	4	06C		59
00090	144	4	06D		60
00092	146	4	06E		61
000CC	204	4	060		90
000D4	212	4	062		94
000DC	220	4	063		98
000DE	222	4	064		99
000E0	224	4	065		100

XREF 1 DECK NAME=*ALIGN * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 7

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES												
000E2	226		4	U66	101												
000E4	228		4	U67	102												
000E6	230		4	U68	103												
000E8	232		4	U69	104												
000B0	176		4	U71	76												
000AE	174		4	U72	75												
00014	20		8	VHA	168	489	490	501	502	513	700	701					
00062	98		4	VHAS	37												
00000	0		2	VHC	323	487	488										
00004	4		2	VHF	325	499	500										
00068	104		4	VUSH	40												
0003A	58		4	VAT	22												
0003C	60		4	VATL	23												
00008	8		4	VATM	6												
0000C	12		4	VATP	7												
0001E	30		1	VOVX	310	523	524	536	537	539	540	579	648				
00022	34		1	VOVY	311	528	529										
00026	38		1	VOVZ	312	532	533										
00014	20		7	VRES1	127												
00018	24		7	VRES2	128												
0001C	28		7	VRES3	129												
00020	32		7	VRES4	130												
00010	16		4	VOT1	8												
00012	18		4	VOT2	9												
*****UNDEFINED*****				VSET		416											
00034	52		4	V1CT	19												
00036	54		4	V2CT	20												
00108	264		7	VA	151	1048											
00026	38		8	VAMI	173	403	543										
00032	50		5	VAVT	117	1054											
00014	20		9	VEVEN	206	450											
00008	8		7	VGOL	124	162	722	723	866								
*****UNDEFINED*****				VINCOS		514	769	1057									
00012	18		9	VIX	205												
00008	8		7	VL	162												
00024	36		7	VMA	131	160	161	587	588	589	849	850					
00000	0		4	VMT1	4												
00004	4		4	VMT2	5												
0001A	26		1	VMHR	309	516	525	526	595								
00000	0		7	VMT	122	686	687	771	1059	1098	1099	1104					
00042	66		1	VX	319	695	725	726	729	730	731	825	826	841	842	844	845
						867	868	879	880	881	900	901	902	994	995	1000	1120
00046	70		1	VY	320	754	755	837	838	961	962	967					
0004A	74		1	VZ	321	720	721	831	832	855	856	888	889	891	892	933	934
						939											
0003E	62		7	V1	137												
00042	66		7	V2	138												
00046	70		7	V3	139												
0004A	74		7	V4	140												
0002A	42		1	TEM	313	552	553	559	560	561	566	567	568	672	673	678	680
						681	682	736	737	742	744	745	750	752	753	780	785
0002E	46		1	TEM0	314	580	581	590	591	596	597	668	669	670	683	684	712
						713	732	733	734	858	859	872	873	876	877	883	884

XREF 1 DECK NAME=*ALIGN *

SKC 2000 CROSS REFERENCE DICTIONARY

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES												
						886	887	890	904	905	908	910	911	988	989		
00032	50	1		TEM2	315	615	616	624	663	664	674	675	676	688	689	716	864
						865	874	955	956								
00036	54	1		TEM4	316	602	603	609	610	738	739	740	746	870	871	875	927
						928											
0001A	26	9		TEN	209												
0006A	106	4		TEST	41												
0000E	14	9		THREE	203												
0005B	88	4		TIME	34	1052	1053	1115	1116								
0012C	300	7		TM	152	914	972	975	1006	1013	1016						
00070	112	4		TMPR	44	1045											
00150	336	7		TM1	153	155	156	158	942	973							
0000C	12	9		TWO	202												
0005C	92	4		TO	35												
00018	24	8		VAX	169	170	171	640	642	649	650	651	660	661	709	710	
00000	0	8		VAXI	165	635	637										
0001C	28	8		VAY	170	665	666										
00020	32	8		VAZ	171												
00066	102	8		VC1X	188	189	190	456	458	459	460	465	466	467	469	470	471
00072	114	8		VC2X	189												
0007E	126	8		VC3X	190	481	482										
						633	638										
*****UNDEFINED*****				VECADD													
00174	372	7		VECT	154												
0008A	138	8		VF1X	191	192	193	428	430	431	432	437	438	439	441	442	443
00096	150	8		VF2X	192												
000A2	162	8		VF3X	193	493	494										
0004C	76	4		VRTV	28												
0011C	284	9		VT	281												
0005E	94	8		VTB	186	707											
00062	98	8		VTC	187	569	570	860									
00010	16	2		WDT	330	508											
00000	0	4		WLDCOM	3												
00010	16	2		WOPP	329	330	765										
0002E	46	8		XA	176	788	829										
00036	54	8		XB	177	861	862										
0003E	62	8		XC	178	822	823	835									
00046	70	8		YA	185	789											
00046	70	8		YA1	179	185	592	593	594								
0004A	74	8		YA2	180	599	600	601									
0004E	78	8		YB1	181	617	618	619									
00052	82	8		YB2	182	628	629	630									
00056	86	8		YC1	183	612	613	614									
0005A	90	8		YC2	184	605	606	607									
0001C	28	9		ZERO	210	212	372	551	585	693	727	728	748	749	756	827	828
						833	834	907	915	937	938	943	965	966	976	998	999
						1080	1102	1103									

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                  $FAP RTEXEC
                                  *
                                  *     EXECUTIVE DATA AREA
                                  *
                1 07FE0   32736 -2          RTNORG   SETx   7FE0          BEGINNING OF RETURN ADDRESS LOCATIONS
                2 07FC0   32704 -2          APOIC    SETx   7FC0          DMA CONTROL WORD AREA
                3 07FC8   32712 -2          PICOUT   SETx   7FC8          INPUT CONTROL WORD LOCATION
                4 07FE8   32744 -2          RET04    SETx   7FE8          INTERRUPT 04 RETURN LOCATION
                5 07FEA   32746 -2          RET05    SETx   7FEA          INTERRUPT 05 RETURN LOCATION
                6 07FF4   32756 -2          RET10    SETx   7FF4          INTERRUPT 10 RETURN LOCATION
                7 03FFE   16382 -2          TEMCOR   SETx   3FFE          SUBLIB STACK ADDRESS
                8 0FF7F   65407 -2          MSK      SETx   FF7F
                9 07800   30720 -2          EXORG    SETx   7800          ORIGIN OF EXECUTIVE ROUTINE
               10 07FA0   32672 -2          INTORG   SETx   7FA0          INTERRUPT TRAP AREA ORIGIN
               11 00218     536 -2          IMSK     SETx   0218          INTERRUPT MASK REGISTER
               12 0B600   46592 -2          DEC      SETx   B600          PDP-11 INTERFACE ROUTINE ADDRESS
               13 06FE0   28640 -2          SDLORG   SETx   6FE0          SIDL DATA AREA ORIGIN
                                  *
                                  *
               14                 0                   USE    0
                                  *
               15                 0                   ORG    INTORG
               16 07FA0   32672   0                   BSS    8
R              17 07FA8   32680   0 6430022C TRP04     JGU    INT04         INTERRUPT 04 VECTOR LOCATION
               18 07FAA   32682   0 643001EA TRP05     JGU    INT05         INTERRUPT 05 VECTOR LOCATION
               19 07FAC   32684   0                   BSS    8
               20 07FB4   32692   0 64300158 TRP10     JGU    INT10         INTERRUPT 10 VECTOR LOCATION
                                  *
                                  *     GEANS WORLD COMMON VARIABLES DATA AREA
                                  *
               21                 4          WLDCOM   COMMON 4
               22 00000       0   4          SRT1     BSS    4             GYRO ROTOR 1 SPEED ACCUMULATION
               23 00004       4   4          SRT2     BSS    4             GYRO ROTOR 2 SPEED ACCUMULATION
               24 00008       8   4          RATM     BSS    4             NEGATIVE R.A.I. PULSE ACCUMULATION
               25 0000C      12   4          RATP     BSS    4             POSITIVE R.A.I. PULSE ACCUMULATION
               26 00010      16   4          ROT1     BSS    2             GYRO 1 ROTOR SPEED ( REV/SECOND )
               27 00012      18   4          ROT2     BSS    2             GYRO 2 ROTOR SPEED ( REV/SECOND )
               28 00014      20   4          DVXG     BSS    4             ACCUMULATED DELT VX
               29 00018      24   4          DVYG     BSS    4             ACCUMULATED DELT VY
               30 0001C      28   4          DVZG     BSS    4             ACCUMULATED DELT VZ
               31 00020      32   4          DPVV     BSS    4             DOPPLER VERTICAL  VELOCITY ACCUMULATION
               32 00024      36   4          DPDV     BSS    4             DOPPLER DRIFT     VELOCITY ACCUMULATION
               33 00028      40   4          DPHV     BSS    4             DOPPLER HEADING   VELOCITY ACCUMULATION
               34 0002C      44   4          GMT      BSS    4             GREENWICH MEAN TIME
               35 00030      48   4          BTE1     BSS    2             BITE ACTUAL STATE MASK WORD 1
               36 00032      50   4          BTE3     BSS    2             BITE ACTUAL STATE MASK WORD 3
               37 00034      52   4          R1CT     BSS    2             COUNTER FOR ROTOR 1 SPEED FAULT
               38 00036      54   4          R2CT     BSS    2             COUNTER FOR ROTOR 2 SPEED FAULT
               39 00038      56   4          CIPM     BSS    2             INPUT POWER MONITOR COUNTER
               40 0003A      58   4          RAT      BSS    2             REDUNDANT AXIS TORQUING (PULSES)
               41 0003C      60   4          RATL     BSS    2             COUNTER FOR RAT
               42 0003E      62   4          DVX      BSS    4             INPUT DELTA VX
               43 00042      66   4          DVY      BSS    4             INPUT DELTA VY
               44 00046      70   4          DVZ      BSS    4             INPUT DELTA VZ
               45 0004A      74   4          CYLE     BSS    2             OUT-OF-TIME FLAG
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VERSION K20A0503      DECK NAME=*RTEXEC*                                                              PAGE   2

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
             46 0004C     76  4          VRTV     BSS     2              DOPPLER VERTICAL VELOCITY
             47 0004E     78  4          DRFV     BSS     2              DOPPLER DRIFT     VELOCITY
             48 00050     80  4          HDGV     BSS     2              DOPPLER HEADING  VELOCITY
             49 00052     82  4          CTR1     BSS     2              PHASE TIMER
             50 00054     84  4          CTR2     BSS     2              INTERNAL SEQUENCING COUNTER
             51 00056     86  4          CTR3     BSS     2              INTERNAL SEQUENCING COUNTER
             52 00058     88  4          TIME     BSS     4              TIME FROM SYSTEM TURN ON (SECONDS)
             53 0005C     92  4          TO       BSS     4              TIME AT ENTRY TO NAV
             54 00060     96  4          ITER     BSS     2              ITERATION COUNTER
             55 00062     98  4          PHAS     BSS     2              AUTOMATIC SEQUENCING PHASE
             56 00064    100  4          NAVF     BSS     2              IN-NAVIGATION MODE FLAG (2/3 - MAN/AUTO)
             57 00066    102  4          DATA     BSS     2              SYSTEM DATA SWITCH (0-7)
             58 00068    104  4          PUSH     BSS     2              PUSHBUTTON SWITCH (0-31)
             59 0006A    106  4          TEST     BSS     2              PRESS TO TEST SWITCH (0/-1)
             60 0006C    108  4          MODE     BSS     2              SYSTEM MODE SWITCH
             61 0006E    110  4          LITE     BSS     2              CDU LIGHTS (SOFTWARE)
             62 00070    112  4          TMPR     BSS     2              TEMP STORAGE LOCATION
                                         *
                                         *    SODL DATA AREA
                                         *
             63 00072    114  4          SODL     EQU     *
             64 00072    114  4          04F      BSS     2        01    FRAME MARKER
             65 00074    116  4          040      BSS     2        02    MSH OF GMT
             66 00076    118  4          041      BSS     2        03    LSH OF GMT
             67 00078    120  4          042      BSS     2        04    MSH OF LATITUDE
             68 0007A    122  4          043      BSS     2        05    LSH OF LATITUDE
             69 0007C    124  4          044      BSS     2        06    MSH OF LONGITUDE
             70 0007E    126  4          045      BSS     2        07    LSH OF LONGITUDE
             71 00080    128  4          047      BSS     2        08    MSH OF VERTICAL VELOCITY
             72 00082    130  4          048      BSS     2        09    LSH OF VERTICAL VELOCITY
             73 00084    132  4          049      BSS     2        10    MSH OF EAST VELOCITY
             74 00086    134  4          04A      BSS     2        11    LSH OF EAST VELOCITY
             75 00088    136  4          04B      BSS     2        12    MSH OF NORTH VELOCITY
             76 0008A    138  4          04C      BSS     2        13    LSH OF NORTH VELOCITY
             77 0008C    140  4          046      BSS     2        14    I.N.S. ALTITUDE
             78 0008E    142  4          06C      BSS     2        15    AHRS HEADING
             79 00090    144  4          06D      BSS     2        16    AHRS PITCH
             80 00092    146  4          06E      BSS     2        17    AHRS ROLL
             81 00094    148  4          018      BSS     2        18    RESET,IMU,DPU,EAU,CDU,DCU,BATT BITE BITS
             82 00096    150  4          030      BSS     2        19    3RD,4TH,5TH,6TH, RIGHT NUMERIC
             83 00098    152  4          031      BSS     2        20    4 DISCRETES; R.ALPHA; 1ST,2ND R. NUMERIC
             84 0009A    154  4          032      BSS     2        21    2ND,3RD,4TH,5TH LEFT NUMERIC
             85 0009C    156  4          033      BSS     2        22    1ST,2ND WAYPOINT; L. ALPHA; 1ST L.NUMERIC
             86 0009E    158  4          034      BSS     2        23    1ST,2ND FROM< 1ST,2ND TO
             87 000A0    160  4          035      BSS     2        24    CDU/ACDU DISPLAY LIGHTS
             88 000A2    162  4          023      BSS     2        25    HEADING
             89 000A4    164  4          021      BSS     2        26    PITCH
             90 000A6    166  4          022      BSS     2        27    ROLL
             91 000A8    168  4          024      BSS     2        28    STEERING SIGNAL
             92 000AA    170  4                   BSS     2        29    BLANK
             93 000AC    172  4          014      BSS     2        30    SEQ CNT,G1,2 RED,G1,2 TERM SHUTDOWN BITS
             94 000AE    174  4          072      BSS     2        31    TORQUE FOR GIMBALS 1 AND 2
             95 000B0    176  4          071      BSS     2        32    TORQUE FOR GIMBALS 3 AND 4
             96 000B2    178  4          04D      BSS     2        33    ROTOR 1,2, ROTOR SPEED
             97 000B4    180  4          04E      BSS     2        34    RAT AND VERTICAL VELOCITY
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VERSION K20A0503      DECK NAME=*RTEXEC*                                                   PAGE   3
                                                                        SOURCE
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM
              98 00086   182  4         050      BSS     2         35   -,+ DELTA VX
              99 00088   184  4         051      BSS     2         36   -,+ DELTA VY
             100 0008A   186  4         052      BSS     2         37   -,+ DELTA VZ
             101 0008C   188  4         053      BSS     2         38   GIMBAL 1 RESOLVER
             102 0008E   190  4         054      BSS     2         39   GIMBAL 2 RESOLVER
             103 000C0   192  4         055      BSS     2         40   GIMBAL 3 RESOLVER
             104 000C2   194  4         056      BSS     2         41   GIMBAL 4 RESOLVER
             105 000C4   196  4         058      BSS     2         42   DATA,MODE,TST AND PUSHBUTTON SWITCHES
             106 000C6   198  4         05D      BSS     2         43   BITE BITS
             107 000C8   200  4         05E      BSS     2         44   BITE BITS
             108 000CA   202  4         025      BSS     2         45   BAROMETRIC ALTITUDE AND BITE BITS
             109 000CC   204  4         060      BSS     2         46   DRIFT AND HEADING VELOCITY
             110 000CE   206  4                  BSS     2         47   SPARE
             111 000D0   208  4                  BSS     2         48   SPARE
             112 000D2   210  4         05A      BSS     2         49   DELTA LATITUDE (FIX)
             113 000D4   212  4         062      BSS     2         50   DELTA LONGITUDE (FIX)
             114 000D6   214  4         057      BSS     2         51   VERTICAL DIFFERENCE VELOCITY
             115 000D8   216  4         058      BSS     2         52   CROSS TRACK DIFFERENCE VELOCITY
             116 000DA   218  4         059      BSS     2         53   ALONG TRACK DIFFERENCE VELOCITY
             117 000DC   220  4         063      BSS     2         54   A11 ALIGNMENT MATRIX
             118 000DE   222  4         064      BSS     2         55   A21 ALIGNMENT MATRIX
             119 000E0   224  4         065      BSS     2         56   A31 ALIGNMENT MATRIX
             120 000E2   226  4         066      BSS     2         57   A12 ALIGNMENT MATRIX
             121 000E4   228  4         067      BSS     2         58   A22 ALIGNMENT MATRIX
             122 000E6   230  4         068      BSS     2         59   A32 ALIGNMENT MATRIX
             123 000E8   232  4         069      BSS     2         60   A13 ALIGNMENT MATRIX
             124 000EA   234  4         06A      BSS     2         61   A23 ALIGNMENT MATRIX
             125 000EC   236  4         06B      BSS     2         62   A33 ALIGNMENT MATRIX
             126 000EE   238  4                  BSS     2         63   SPARE
             127 000F0   240  4                  BSS     2         64   SPARE
             128 000F2   242  4         AJ       BSS     36             ALIGNMENT MATRIX
                                        *
                                        *
             129                  7     MATCOM   COMMON 7               MATRIX,VECTOR,AND MISCELLANEOUS DATA
                                        *
             130 00000     0  7         SWT      BSS     4              SIN(OMEGA T)
             131 00004     4  7         CWT      BSS     4              COS(OMEGA T)
             132 00008     8  7         SGDL     BSS     4              SIN(GEODETIC LATITUDE)
             133 0000C    12  7         CGDL     BSS     4              COS(GEODETIC LATITUDE)
             134 00010    16  7         ALT      BSS     4              ALTITUDE
                                        *
                                        *    GIMBAL RESOLVER POSITION (BIAS EXCLUDED)
                                        *
             135 00014    20  7         RES1     BSS     4
             136 00018    24  7         RES2     BSS     4
             137 0001C    28  7         RES3     BSS     4
             138 00020    32  7         RES4     BSS     4
             139 00024    36  7         SRA      BSS     8              SUM OF 1-(G KNOWN)/(G ACCELERATION)
             140 0002C    44  7         NMO      BSS     2
                                        *
                                        *    COSINES OF CORRECTED GIMBAL ANGLES
                                        *
             141 0002E    46  7         C1       BSS     4
             142 00032    50  7         C2       BSS     4
             143 00036    54  7         C3       BSS     4
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VERSION K20A0503     DECK NAME=*RTEXEC*                                                              PAGE   4

DIAGNOSTICS LINE ADRES UADRES LC  PROGRAM                        SOURCE
            144 0003A      58  7      C4        BSS     4
                                      *
                                      *    SINES OF CORRECTED GIMBAL ANGLES
                                      *
            145 0003E      62  7      S1        BSS     4
            146 00042      66  7      S2        BSS     4
            147 00046      70  7      S3        BSS     4
            148 0004A      74  7      S4        BSS     4
                                      *
            149 0004E      78  7      KSN1      BSS     2          GAIN COLUMN INDEX
            150 00050      80  7      KSN2      BSS     2          GAIN COLUMN INDEX
            151 00052      82  7      KSN3      BSS     2          GAIN COLUMN INDEX
            152 00054      84  7      D1        BSS     36         TEMP 3X3 MATRIX
            153 00078     120  7      DG        BSS     36         TOTAL GIMBAL AND THEN TSP2
                                      *
                                      *    STATE MATRIX ( STORED ROW MAJOR ORDER )
                                      *****       E11 = PSI = HEADING
                                      *****       E12 = THETA = PITCH
                                      *****       E13 = PHI = ROLL
                                      *
                                      *
            154 0009C     156  7      E1        BSS     12
            155 000A8     168  7      E2        BSS     12
            156 000B4     180  7      E3        BSS     12
            157 000C0     192  7      OC        BSS     36         VEHICLE TO CASE TRANSFORMATION MATRIX
            158 000E4     228  7      D         BSS     36         TEMP 3X3 MATRIX
            159 00108     264  7      SA        BSS     36         SAVE AJ MATRIX
            160 0012C     300  7      TM        BSS     36         TEMP 3X3 MATRIX
            161 00150     336  7      TM1       BSS     36         TEMP 3X3 MATRIX
            162 00174     372  7      VECT      BSS     34         TABLE OF SUBROUTINE CALLS
            163 00150     336  7      AP        EQU     TM1        TEMP 3X1 VECTOR
            164 0015C     348  7      AT        EQU     TM1+12     TEMP 3X1 VECTOR
            165 000E4     228  7      J3X3      EQU     D
            166 00150     336  7      K3X3      EQU     TM1
            167 00054      84  7      L3X3      EQU     D1
            168 00024      36  7      LCA1      EQU     SRA        LAST GIMBAL 1 COMMAND
            169 00028      40  7      LCA4      EQU     SRA+4      LAST GIMBAL 4 COMMAND
            170 00008       8  7      SL        EQU     SGDL       SIN(LAT) GEODETIC
            171 0000C      12  7      CL        EQU     CGDL       COS(LAT) GEODETIC
                                      *
                                      *
            172                11     SPEXMC    COMMON 11          EXEC,SPIN,AND MISC COMMON DATA
                                      *
            173 00000       0 11      BDS1      BSS     2          BITE DESIRED STATE MASK - WORD 1
            174 00002       2 11      BDS2      BSS     2          BITE DESIRED STATE MASK - WORD 2
            175 00004       4 11      BDS3      BSS     2          BITE DESIRED STATE MASK - WORD 3
            176 00006       6 11      BDS4      BSS     2          BITE DESIRED STATE MASK - WORD 4
            177 00008       8 11      BMK1      BSS     2          BITE CHECK ENABLE MASK - WORD 1
            178 0000A      10 11      BMK2      BSS     2          BITE CHECK ENABLE MASK - WORD 2
            179 0000C      12 11      BMK3      BSS     2          BITE CHECK ENABLE MASK - WORD 3
            180 0000E      14 11      BMK4      BSS     2          BITE CHECK ENABLE MASK - WORD 4
            181 00010      16 11      HOLD      BSS     2          SEQUENCING HOLD FLAG
            182 00012      18 11      LPTK      BSS     2          LAST PASS TORQUE DISCRETE
            183 00014      20 11      TEMP      BSS     2
            184 00016      22 11      TEMP2     BSS     2
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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
            185 00018     24 11          TEMP4    BSS    2
            186 0001A     26 11          MASK     BSS    2          SPIN TERMINATE FLAG STORE
            187 0001C     28 11          ANGL     BSS    4          GYRO INVERT ANGLE STORE
            188 00020     32 11          DATI     BSS    2          LAST PASS DATA SWITCH INPUT VALUE
            189 00022     34 11          LHED     BSS    2          AHRS HEADING
            190 00024     36 11          LPCH     BSS    2          AHRS PITCH
            191 00026     38 11          LROL     BSS    2          AHRS ROLL
            192 00028     40 11          CMD1     BSS    4          GIM 1 RESOLVER COMMAND ( BIAS INCLUDED )
            193 0002C     44 11          CMD2     BSS    4          GIM 2 RESOLVER COMMAND ( BIAS INCLUDED )
            194 00030     48 11          CMD3     BSS    4          GIM 3 RESOLVER COMMAND ( BIAS INCLUDED )
            195 00034     52 11          CMD4     BSS    4          GIM 4 RESOLVER COMMAND ( BIAS INCLUDED )
            196 00014     20 11          OMAX     EQU    TEMP
                                         *
                                         *
                                         *
                                         *    GEANS WORLD COMMON CONSTANTS DATA AREA
                                         *
            197               9          CONCOM   COMMON 9
                                         *
            198 00000      0  9 FFFFFFC0 N64      DEC    -64
            199                          EVEN
R           200 00002      2  9          DCSK     BSS    2
            201 00004      4  9          NFOUR    BSS    2
            202 00006      6  9          NTWO     BSS    2
            203 00008      8  9          NONE     BSS    2
            204 0000A     10  9          ONE      BSS    2
            205 0000C     12  9          TWO      BSS    2
            206 0000E     14  9          THREE    BSS    2
            207 00010     16  9          FOUR     BSS    2
            208 00012     18  9          SIX      BSS    2
            209 00014     20  9          SEVEN    BSS    2
            210 00016     22  9          EIGHT    BSS    2
            211 00018     24  9          NINE     BSS    2
            212 0001A     26  9          TEN      BSS    2
            213 0001C     28  9          ZERO     BSS    2
            214 0001E     30  9          FONE     BSS    2
            215 0001C     28  9          DFONE    EQU    ZERO
            216                          EVEN
            217 00020     32  9          ONHLF    BSS    4
            218 00024     36  9          OMGA     BSS    4          EARTH ROTATION RATE  RAD/SEC
            219 00028     40  9          OMEG     BSS    4           EARTH RATE   PI RAD/SEC
            220 0002C     44  9          KGDL     BSS    4          GEODETIC LATITUDE CONSTANT
            221 00030     48  9          DELT     BSS    4          DELTA TIME = 1/8 SECOND
            222 00034     52  9          D1032    BSS    4          DOUBLE PRECISION 1/32
            223 00038     56  9          D3032    BSS    4          =3/32
                                         *
                                         *    CALIBRATION DATA.    CD01-CD64
                                         *
            224                          EVEN
            225 0003C     60  9          CD01     BSS    4          X ACCEL SCALE FACTOR  M/SEC/PULSE
            226 00040     64  9          CD02     BSS    4          Y ACCEL SCALE FACTOR  M/SEC/PULSE
            227 00044     68  9          CD03     BSS    4          Z ACCEL SCALE FACTOR  M/SEC/PULSE
            228 00048     72  9          CD04     BSS    4          X ACCEL BIAS   PULSE/SEC
            229 0004C     76  9          CD05     BSS    4          Y ACCEL BIAS   PULSE/SEC
            230 00050     80  9          CD06     BSS    4          Z ACCEL BIAS   PULSE/SEC
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VERSION K20A0503      DECK NAME=*RTEXEC*                                                              PAGE   6

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            231 00054    84   9          CD07    BSS    4            B11 ACCEL MISALIGNMENT
            232 00058    88   9          CD08    BSS    4            B12 ACCEL MISALIGNMENT
            233 0005C    92   9          CD09    BSS    4            B13 ACCEL MISALIGNMENT
            234 00060    96   9          CD10    BSS    4            B21 ACCEL MISALIGNMENT
            235 00064   100   9          CD11    BSS    4            B22 ACCEL MISALIGNMENT
            236 00068   104   9          CD12    BSS    4            B23 ACCEL MISALIGNMENT
            237 0006C   108   9          CD13    BSS    4            B31 ACCEL MISALIGNMENT
            238 00070   112   9          CD14    BSS    4            B32 ACCEL MISALIGNMENT
            239                                  EVEN
            240 00074   116   9          CD15    BSS    4            B33 ACCEL MISALIGNMENT
            241 00078   120   9          CD16    BSS    4            GYRO TORQUE,G INDEPEN,DYNE-CM
            242 0007C   124   9          CD17    BSS    4            GYRO TORQUE,G INDEPEN,DYNE-CM
            243 00080   128   9          CD18    BSS    4            GYRO TORQUE,G INDEPEN,DYNE-CM
            244 00084   132   9          CD19    BSS    4            G11 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            245 00088   136   9          CD20    BSS    4            G12 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            246 0008C   140   9          CD21    BSS    4            G13 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            247 00090   144   9          CD22    BSS    4            G21 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            248 00094   148   9          CD23    BSS    4            G22 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            249 00098   152   9          CD24    BSS    4            G23 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            250 0009C   156   9          CD25    BSS    4            G31 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            251 000A0   160   9          CD26    BSS    4            G32 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            252 000A4   164   9          CD27    BSS    4            G33 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            253 000A8   168   9          CD28    BSS    4            RAT GYRO TORQUE  DYNE-CM
            254 000AC   172   9          CD29    BSS    4            RAT GYRO TORQUE  DYNE-CM
            255 000B0   176   9          CD30    BSS    4            SPEED COMP,G INDEPENDENT  DYNE-CM
            256 000B4   180   9          CD31    BSS    4            SPEED COMP,G INDEPENDENT  DYNE-CM
            257 000B8   184   9          CD32    BSS    4            SPEED COMP,G INDEPENDENT  DYNE-CM
            258 000BC   188   9          CD33    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            259 000C0   192   9          CD34    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            260 000C4   196   9          CD35    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            261 000C8   200   9          CD36    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            262 000CC   204   9          CD37    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            263 000D0   208   9          CD38    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            264 000D4   212   9          CD39    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            265                                  EVEN
            266 000D8   216   9          CD40    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            267 000DC   220   9          CD41    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            268 000E0   224   9          CD42    BSS    4            A18P RAT SPEED COMP  DYNE-CM
            269 000E4   228   9          CD43    BSS    4            A19P RAT SPEED COMP  DYNE-CM
            270 000E8   232   9          CD44    BSS    4            STARTING LOCUS          PI RADIANS
            271 000EC   236   9          CD45    BSS    4            BETA(12) MISALIGNMENT   PI RADIANS
            272 000F0   240   9          CD46    BSS    4            GIMBAL 1 RESOLVER BIAS  PI RADIANS
            273 000F4   244   9          CD47    BSS    4            GIMBAL 2 RESOLVER BIAS  PI RADIANS
            274 000F8   248   9          CD48    BSS    4            GIMBAL 3 RESOLVER BIAS  PI RADIANS
            275 000FC   252   9          CD49    BSS    4            GIMBAL 4 RESOLVER BIAS  PI RADIANS
            276 00100   256   9          CD50    BSS    4            PLATFORM AZIMUTH ALIGN IN PI RADIANS
            277 00104   260   9          CD51    BSS    4            PLATFORM ELEVATION ALIGN IN PI RADIANS
            278 00108   264   9          CD52    BSS    4            VERTICAL DAMPING CONSTANT,
                                         *                           0.59594852 IN M/SEC/M*2**31
            279 0010C   268   9          CD53    BSS    4            VERTICAL VELOCITY GAIN    UNITLESS
            280 00110   272   9          HEDL    BSS    4            LOADED HEADING IN PI RADIANS = CD54
            281 00110   272   9          CD54    EQU    HEDL
            282 00114   276   9          CD55    BSS    4            LOADED LATITUDE         PI RADIANS
            283 00118   280   9          CD56    BSS    4            LOADED LONGITUDE        PI RADIANS
            284 0011C   284   9          CD57    BSS    4            LOCAL GRAVITY           METERS/SEC**2
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VERSION K20A0503      DECK NAME=*RTEXEC*                                                                    PAGE   7

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
            285 00120    288  9           CD58     BSS     4             1/SCALE FACTOR           PULSES/M/SEC
            286 00124    292  9           CD59     BSS     4             ROTOR 1 SPEED        REVOLUTIONS/SEC
            287 00128    296  9           CD60     BSS     4             ROTOR 2 SPEED        REVOLUTIONS/SEC
            288 0012C    300  9           CD61     BSS     4             BARO ALT SCALE FACTOR    METERS/BIT
            289 00130    304  9           CD62     BSS     4             BARO ALTITUDE BIAS       BITS
            290 00134    308  9           CD63     BSS     4             ALTIMETER / AHRS FLAGS   NONE
            291 00138    312  9           CD64     BSS     4             ALTITUDE                 METERS
                                          *
            292                12         BITCOM   COMMON 12
            293 00000      0 12 80000000 B1        HEX     80000000
            294 00002      2 12 40000000 B2        HEX     40000000
            295 00004      4 12 20000000 B3        HEX     20000000
            296 00006      6 12 10000000 B4        HEX     10000000
            297 00008      8 12 08000000 B5        HEX     08000000
            298 0000A     10 12 04000000 B6        HEX     04000000
            299 0000C     12 12 02000000 B7        HEX     02000000
            300 0000E     14 12 01000000 B8        HEX     01000000
            301 00010     16 12 00800000 B9        HEX     00800000
            302 00012     18 12 00400000 B10       HEX     00400000
            303 00014     20 12 00200000 B11       HEX     00200000
            304 00016     22 12 00100000 B12       HEX     00100000
            305 00018     24 12 00080000 B13       HEX     00080000
            306 0001A     26 12 00040000 B14       HEX     00040000
            307 0001C     28 12 00020000 B15       HEX     00020000
            308 0001E     30 12 00010000 B16       HEX     00010000
                                          *
                                          *
                                          *
            309                 1                  USE     1
                                          *
                                          *
            310                                    EVEN
            311 00000      0  1           BDSIR    BSS     2             RETURN ADDRESS LOCATION
            312 00002      2  1           CDUIR    BSS     2             CDUI AND CDU RETURN LOCATION
            313 00004      4  1           DECDR    BSS     2             DECODE RETURN ADDRESS LOCATION
            314 00006      6  1           CDUS1    BSS     2             CDU SOFTWARE SWITCH 1
            315 00008      8  1           CDUS2    BSS     2             CDU SOFTWARE SWITCH 2
            316 0000A     10  1           DMASAV   BSS     2             SAVE INT 10 STATUS REGISTER
            317 0000C     12  1                    BSS     2             SAVE A REGISTER
            318 0000E     14  1                    BSS     2             SAVE B REGISTER
            319 00010     16  1                    BSS     2             SAVE INT 05 STATUS REGISTER
            320 00012     18  1                    BSS     2             SAVE INT 04 STATUS REGISTER
                                          *
                                          *    DMA ERROR WORD BITS ARE SET AS FOLLOWS:
                                          *********** BIT 31 ON = SODL OPE OR OFT ERROR
                                          *********** BIT 30 ON = FIRST 05 SIDL WORD TRANSFER ERROR
                                          *********** BIT 29 ON =  LAST 10 SIDL WORD TRANSFER ERROR
                                          *********** BIT 28 ON = INT 10 OCCURRED WITH DMA NOT READY FOR START
                                          *********** BIT 27 ON = CYLE .GT. 2 ON EXECUTION OF DECODE
                                          *********** BITS 26 - 0 UNUSED
                                          *
            321 00014     20  1           DMAERR   BSS     2             DMA ERROR WORD
            322 00016     22  1           ERRCNT   BSS     2             DMA ERROR COUNT WORD
            323 00018     24  1           BLP1     BSS     2             ACCUMULATED ERROR WORD 1 BITS
            324 0001A     26  1           BLP2     BSS     2             ACCUMULATED ERROR WORD 2 BITS
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VERSION K20A0503      DECK NAME=*RTEXEC*                                                                          PAGE   8

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
            325 0001C    28  1            BLP3     BSS     2               ACCUMULATED ERROR WORD 3 BITS
            326 0001E    30  1            BLP4     BSS     2               ACCUMULATED ERROR WORD 4 BITS
            327 00020    32  1            BNBR     BSS     2               BITE ERROR COUNTER
            328 00022    34  1            BCTR     BSS     2               BITE ERROR TIMER
            329 00024    36  1            HCTR     BSS     2               DELAY WHEN RESTARTING FROM TEMPORARY HOLD
            330 00026    38  1            MALF     BSS     2               INSTANTANEOUS MALFUNCTION NUMBER
            331 00028    40  1            MLFN'    BSS     2               LAST BITE MALFUNCTION NUMBER
            332 0002A    42  1            BER1     BSS     2               BITE ERROR WORD 1
            333 0002C    44  1            BER2     BSS     2               BITE ERROR WORD 2
            334 0002E    46  1            BER3     BSS     2               BITE ERROR WORD 3
            335 00030    48  1            BER4     BSS     2               BITE ERROR WORD 4
            336 00032    50  1            EXNO     BSS     2               REAL TIME IN PROGRESS FLAG
            337 00034    52  1            GSCT     BSS     2               GIMBAL STUCK COUNTER
            338 00036    54  1            BARO     BSS     2               BAROMETRIC ALTITUDE
            339 00038    56  1            ROTR     BSS     2
            340 0003A    58  1            TDVX     BSS     12              TEMP STORAGE FOR RAW DELTA V'S
                                          *
                                          *
                                          *    SIDL DATA AREA - ORIGIN AT ADDRESS 6FE0 - HIGH END OF
                                          *    UNPROTECTED CORE
                                          * .
            341                 10                 USE     10
            342                 10                 ORG     SDLORG
                                          *
            343 06FE0  28640 10           I4F      BSS     2               TURN AROUND WORD
            344 06FE2  28642 -1           SIDL     EQU     *
            345 06FE2  28642 10           I71      BSS     2               IMU/RESOLVER 1
            346 06FE4  28644 10           I72      BSS     2               IMU/RESOLVER 2
            347 06FE6  28646 10           I73      BSS     2               IMU/RESOLVER 3
            348 06FE8  28648 10           I74      BSS     2               IMU/RESOLVER 4
            349 06FEA  28650 10           I75      BSS     2               IMU / + DELTA V
            350 06FEC  28652 10           I76      BSS     2               IMU / - DELTA V
            351 06FEE  28654 10           I77      BSS     2               IMU / RAT - ROTOR SPEED
            352 06FF0  28656 10           I21      BSS     2               DPU / BARO ALTIMETER
            353 06FF2  28658 10           I22      BSS     2               DPU / DOP VELOCITY
            354 06FF4  28660 10           I13      BSS     2               EAU / BITE BITS
            355 06FF6  28662 10           I3F      BSS     2               CDU / SWITCHES
            356 06FF8  28664 10           I24      BSS     2               DPU / AHRS HEADING
            357 06FFA  28666 10           I28      BSS     2               DPU / AHRS PITCH
            358 06FFC  28668 10           I2C      BSS     2               DPU / AHRS ROLL
                                          *
                                          *
                                          *
            359                  2                 USE     2
                                          *
                                          *
            360 00000     0  2 00000300 RMAX     DEC     768             MAXIMUM ALLOWED ROTOR SPEED
            361 00002     2  2 00000190 RMIN     DEC     400             MINIMUM ALLOWED ROTOR SPEED
            362 00004     4  2 0000C020 LITCOM   HEX     C020
            363 00006     6  2 00008000 BIT16    HEX     8000
R           364 00008     8  2 64307846 VECJMP   JGU     EX30A
            365 0000A    10  2 64040104 CDUJMP   JS      CDU
            366 0000C    12  2 64040000 JDUMY    JS      DUMY
            367 0000E    14  2 64040000 BITEJM   JS      BITE
            368 00010    16  2 64040300 DECDJM   JS      DECD
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VERSION K20A0503 DECK NAME=*RTEXEC*

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM	SOURCE			
369	00012	18	2	64040000	GASCJM	JS	GASC	
370	00014	20	2	64040000	SPINJM	JS	SPIN	
371	00016	22	2	00000800	BTIN	HEX	0800	INITIAL VALUES FOR BDS(I) I=1,4
372	00018	24	2	0000700F		HEX	700F	
373	0001A	26	2	00000000		HEX	0	
374	0001C	28	2	00000000		HEX	0	
375	0001E	30	2	00001D00		HEX	1D00	INITIAL VALUES FOR BMK(I) I=1,4
376	00020	32	2	0000FE8F		HEX	FE8F	
377	00022	34	2	0000E409		HEX	E409	
378	00024	36	2	0000FFFF		HEX	FFFF	
379	00026	38	2	0000E120	KLIT	HEX	E120	
					*			
					* TABLE SODLIN IS INITIALIZATION FOR THE SODL			
					*			
380	00028	40	2	F417F3DA	SODLIN	HEX	F417F3DA	
381	0002A	42	2	04270000		HEX	04270000	
382	0002C	44	2	14370000		HEX	14370000	
383	0002E	46	2	24470000		HEX	24470000	
384	00030	48	2	34570000		HEX	34570000	
385	00032	50	2	44670000		HEX	44670000	
386	00034	52	2	54770000		HEX	54770000	
387	00036	54	2	74120000		HEX	74120000	
388	00038	56	2	84220000		HEX	84220000	
389	0003A	58	2	94310000		HEX	94310000	
390	0003C	60	2	A4F30000		HEX	A4F30000	
391	0003E	62	2	B4420000		HEX	B4420000	
392	00040	64	2	C4820000		HEX	C4820000	
393	00042	66	2	64C20000		HEX	64C20000	
394	00044	68	2	C6000000		HEX	C6000000	
395	00046	70	2	D6000000		HEX	D6000000	
396	00048	72	2	E6000000		HEX	E6000000	
397	0004A	74	2	81000000		HEX	81000000	
398	0004C	76	2	0300FFFF		HEX	0300FFFF	
399	0004E	78	2	13007FFF		HEX	13007FFF	
400	00050	80	2	2300FFFF		HEX	2300FFFF	
401	00052	82	2	3300FFFF		HEX	3300FFFF	
402	00054	84	2	4300FFFF		HEX	4300FFFF	
403	00056	86	2	53000000		HEX	53000000	
404	00058	88	2	32000000		HEX	32000000	
405	0005A	90	2	12000000		HEX	12000000	
406	0005C	92	2	22000000		HEX	22000000	
407	0005E	94	2	42000000		HEX	42000000	
408	00060	96	2	00000000		HEX	00000000	
409	00062	98	2	41000000		HEX	41000000	
410	00064	100	2	27007C7C		HEX	27007C7C	
411	00066	102	2	17007C7C		HEX	17007C7C	
412	00068	104	2	04000000		HEX	04000000	
413	0006A	106	2	E4000000		HEX	E4000000	
414	0006C	108	2	05000000		HEX	05000000	
415	0006E	110	2	15000000		HEX	15000000	
416	00070	112	2	25000000		HEX	25000000	
417	00072	114	2	35000000		HEX	35000000	
418	00074	116	2	45000000		HEX	45000000	
419	00076	118	2	55000000		HEX	55000000	
420	00078	120	2	65000000		HEX	65000000	

VERSION K20A0503 DECK NAME=*RTEXEC*

DIAGNOSTICS	LINE	ADRES	DADRES	LC	PROGRAM			SOURCE	
	421	0007A	122	2	85000000		HEX	85000000	
	422	0007C	124	2	D5000000		HEX	D5000000	
	423	0007E	126	2	E5000000		HEX	E5000000	
	424	00080	128	2	52000000		HEX	52000000	
	425	00082	130	2	06000000		HEX	06000000	
	426	00084	132	2	00000000		HEX	00000000	
	427	00086	134	2	00000000		HEX	00000000	
	428	00088	136	2	A5000000		HEX	A5000000	
	429	0008A	138	2	26000000		HEX	26000000	
	430	0008C	140	2	75000000		HEX	75000000	
	431	0008E	142	2	85000000		HEX	85000000	
	432	00090	144	2	95000000		HEX	95000000	
	433	00092	146	2	36000000		HEX	36000000	
	434	00094	148	2	46000000		HEX	46000000	
	435	00096	150	2	56000000		HEX	56000000	
	436	00098	152	2	66000000		HEX	66000000	
	437	0009A	154	2	76000000		HEX	76000000	
	438	0009C	156	2	86000000		HEX	86000000	
	439	0009E	158	2	96000000		HEX	96000000	
	440	000A0	160	2	A6000000		HEX	A6000000	
	441	000A2	162	2	B6000000		HEX	B6000000	
	442	000A4	164	2	00000000		HEX	0	
	443	000A6	166	2	00000000		HEX	0	
						*			
	444	000A8	168	2	0F000000	C30S23	SCLB	30,8	
	445	000AA	170	2	05000000	C10S23	SCLB	10,8	
	446	000AC	172	2	00000021	S1A32	SCLB	1.03125,26	=1.03125
	447	000AE	174	2	40600000	F304	DEC	0.75	
	448	000B0	176	2	80808080	MSBMSK	HEX	80808080	
	449	000B2	178	2	003F0000	SWMSK	HEX	003F0000	
	450	000B4	180	2	FFE00000	ITRMSK	HEX	FFE00000	
	451	000B6	182	2	007F0000	RATMS1	HEX	007F0000	
	452	000B8	184	2	01FF0000	RATMS2	HEX	01FF0000	
	453	000BA	186	2	7E000000	RATMS3	HEX	7E000000	
	454	000BC	188	2	00FF0000	TEMSK	HEX	00FF0000	
	455	000BE	190	2	000F0000	IMUMSK	HEX	000F0000	
	456	000C0	192	2	0E000000	BTEMSK	HEX	0E000000	
	457	000C2	194	2	00300000	THTY	HEX	00300000	
	458	000C4	196	2	000000FF	MEDMSK	HEX	000000FF	
	459	000C6	198	2	00060000	0006	HEX	00060000	
	460	000C8	200	2	F0000000	F	HEX	F0000000	
	461	000CA	202	2	FF000000	FF	HEX	FF000000	
	462	000CC	204	2	FFFF0000	FFFF	HEX	FFFF0000	
	463	000CE	206	2	F00F0000	F00F	HEX	F00F0000	
	464	000D0	208	2	FF0F0000	FF0F	HEX	FF0F0000	
	465	000D2	210	2	FFFD0000	FFFD	HEX	FFFD0000	
	466	000D4	212	2	FFFE0000	FFFE	HEX	FFFE0000	
	467	000D6	214	2	0FF00000	OFF0	HEX	0FF00000	
	468	000D8	216	2	00FF0000	OOFF	HEX	00FF0000	
	469	000DA	218	2	0FFF0000	OFFF	HEX	0FFF0000	
	470	000DC	220	2	FFFFFF3F	FF3F	HEX	FFFFFF3F	
	471	000D6	214	2		FAILMS	EQU	OFF0	
	472	000DE	222	2	4F0CC003	POCC1	HEX	4F0CC003	
	473	000E0	224	2	0F04400B	POCC2	HEX	0F04400B	
	474	000E2	226	2	4F066009	PICC1	HEX	4F066009	

VERSION K20A0503 DECK NAME=*RTEXEC*

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM			SOURCE
475	000E4	228	2	0F020000	PICC2	HEX	0F020000
476	000E6	230	2	0F00000F	PCCKST	HEX	0F00000F
477	000E8	232	2	400F0000	MSK1	HEX	400F0000
478	000EA	234	2	0F000000	MSK2	HEX	0F000000
479	000EC	236	2	FF7FFFFF	FG1ZER	HEX	FF7FFFFF
480			2		POC1	VFD	4/0,10/127,18/SODL
481			2		POC2	VFD	4/8,10/1,18/SODL
482			2		PIC2	VFD	4/0,10/9,18/SIDL-2
483			2		PIC3	VFD	4/0,10/19,18/I74+2

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                          *
                                          *     INITIALIZATION FOR GEANS SKC-2000 EXECUTIVE ROUTINE
                                          *
            485                3                    USE    3
            486                                     EVEN
            487                3                    ORG    EXORG
            488 07800  30720   3 9C01001C EXEC      LDS    ZERO          CLEAR STATUS REGISTER
                                          *
                                          *     CLEAR PROCESSOR INTERRUPT STATE
                                          *
            489 07802  30722   3 5C2A001E           LDX    5,30,*M       INITIALIZE LOOP
            490 07804  30724   3 3400780A EX00      LAE    RTNCLR        LOAD ADDRESS OF COUNT DOWN
            491 07806  30726   3 3E807FE0           STA    RTNORG,5      STORE IN RETURN ADDRESS
            492 07808  30728   3 76807FE0           RTA    RTNORG,5      RTA THRU RETURN ADDRESS
            493 0780A  30730   3 6C2B0002 RTNCLR    IMN    5,2,*M        DECREMENT COUNTER
            494 0780C  30732   3 64307804           JGU    EX00          GO BACK FOR ANOTHER
            495 0780E  30734   3 5C323FFE           LDX    6,TEMCOR,*M   SET (XR6) TO ADDRESS OF STACK
            496 07810  30736   3 5C2A001E           LDX    5,30,*M
            497 07812  30738   3 1400000C           LDA    JDUMY
            498 07814  30740   3 3E800174 EX01      STA    VECT,5        SET ALL ENTRIES IN VECT TO 'CALL DUMY'
            499 07816  30742   3 6C2B0002           IMN    5,2,*M
            500 07818  30744   3 64307814           JGU    EX01
            501 0781A  30746   3 14000008           LDA    VECJMP
            502 0781C  30748   3 3C000194           STA    VECT+32       SET RETURN JUMP FROM VECT
                                          *
            503 0781E  30750   3 640402AA           JS     BDSI          INITIALIZE SYSTEM VARIABLES
            504 07820  30752   3 640400F6           JS     CDUI          INITIALIZE SKC-2000 CDU FLAGS
                                          *
                                          *     SEA INITIALIZATION
                                          *
            505 07822  30754   3 140000E6           LDA    PCCRST
            506 07824  30756   3 4820               DOA    4             RESET DMA INPUT AND OUTPUT CHANNELS
            507 07825  30757   3     4828           DOA    5
            508 07826  30758   3 0301               SET    1             SET DMA NOT READY FLAG
GENERATED                                 0700
            509 07828  30760   3 FC030218           LDI    IMSK,*M       SET INTERRUPT 4,5,AND 10 MASKS
            510 0782A  30762   3 1400001C           LDA    ZERO
            511 0782C  30764   3 3C000032           STA    EXNO          EXNO=0
            512 0782E  30766   3 14000008           LDA    NONE
            513 07830  30768   3 3C000016           STA    ERRCNT        ERRCNT=-1
            514 07832  30770   3 0080               EMI                  ENABLE MEMORY INTERRUPTS
            515 07833  30771   3     0200           EPI                  ENABLE PROGRAM INTERRUPTS
            516 07834  30772   3 6000               JU     *             WAIT FOR FIRST 32 HZ INTERRUPT
                                          *
                                          *     SKC-2000 EXECUTIVE BEGINS HERE
                                          *
GENERATED                                 0700
            517 07836  30774   3 1400000A EX30      LDA    ONE
            518 07838  30776   3 3C000032           STA    EXNO          EXNO SET TO NON - ZERO
            519 0783A  30778   3 14000060           LDA    ITER
            520 0783C  30780   3 84000014           AND    SEVEN         CHECK ITER FOR 1/4 SECOND
            521 0783E  30782   3 6106               JN     NORSET
GENERATED                                 0700
            522 07840  30784   3 1400000C           LDA    TWO
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                                        PAGE  13

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            523 07842  30786  3 48A8                 DOA    21         RESET WATCHDOG TIMER AT 1/4 SECOND
GENERATED                          0700
            524 07844  30788  3 64300174 NORSET      JU     VECT       EXECUTE VECTOR TABLE
                                         *
                                         *
            525 07846  30790  3 0100     EX30A       DPI               DISABLE PROGRAM INTERRUPTS
GENERATED                          0700
            526 07848  30792  3 1400004A             LDA    CYLE
            527 0784A  30794  3 3C000032             STA    EXNO       EXNO=CYLE
            528 0784C  30796  3 0200                 EPI               ENABLE PROGRAM INTERRUPTS
            529 0784D  30797  3     6197             JN     EX30       IF EXNO.NE.0 EXECUTE VECTOR TABLE
            530 0784E  30798  3 6404B600 EX70        JS     DEC        CALL PDP-11 INTERFACE ROUTINE
            531 07850  30800  3 6082                 JU     EX70       WAIT FOR NEXT 32 HZ INTERRUPT
R           532 07851  30801  3                      BSS    2
```

VERSION K20A0503 DECK NAME=*RTEXEC*

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                  *
                                  *     INITIALIZE SUBROUTINE CDU
                                  *
          534                2                    USE    2
          535                                     ENTRY  CDUI
          536                                     EVEN
          537 000F6    246   2 00000002 CDUI      PTR    CDUIR
          538 000F8    248   2 1400001C           LDA    ZERO
          539 000FA    250   2 3C000006           STA    CDUS1        CDUS1=CDUS2=0
          540 000FC    252   2 3C000008           STA    CDUS2
          541 000FE    254   2 1400000A           LDA    CDUJMP
          542 00100    256   2 3C000178           STA    VECT+4       3RD ENTRY OF VECT = 'CALL CDU'
          543 00102    258   2 74000002           RTA    CDUIR
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
                                              *
                                              *    SKC-2000 CDU ROUTINE. SYNCRONIZES SKC-2000 ALIGNMENT WITH
                                              *    HONEYWELL ALIGNMENT
                                              *
          545                 2                         USE    2
          546                                           ENTRY  CDU
          547                                           EVEN
          548 00104    260  2 00000002 CDU              PTR    CDUIR
          549 00106    262  2 14000006                  LDA    CDUS1         IF CDUS1 .NE. 0 BYPASS SW3 TEST
          550 00108    264  2 612C                      JN     CDU40
GENERATED                         0700
          551 0010A    266  2 6598012C                  JGW    CDU30,3       IF SW3 IS ON CALL FENT IMMEDIATELY
          552 0010C    268  2 14000008                  LDA    CDUS2         IF CDUS2 .NE. 0 TEST FOR 601
                                             *                               ALIGNMENT RE-ENTRY
          553 0010E    270  2 610E                      JN     CDU20
GENERATED                         0700
          554 00110    272  2 1400006C                  LDA    MODE          IS MODE SET FOR ALIGNMENT
          555 00112    274  2 E4000010                  SBU    FOUR          IF MODE .LT. 4 SYSTEM IS IN NAV
          556 00114    276  2 6206                      JG     CDU10         SYSTEM STILL IN ALIGN - RETURN
GENERATED                         0700
          557 00116    278  2 1400000A                  LDA    ONE           SYSTEM IN NAV - SET CDUS2 NON ZERO
          558 00118    280  2 3C000008                  STA    CDUS2         CDUS2=1
          559 0011A    282  2 74000002 CDU10            RTA    CDUIR
                                             *
          560 0011C    284  2 1400006C CDU20            LDA    MODE
          561 0011E    286  2 E4000010                  SBU    FOUR          HAS 601 RE-ENTERED ALIGN
          562 00120    288  2 6204                      JG     CDU21         YES - GO CHECK MODE START SWITCH
GENERATED                         0700
          563 00122    290  2 74000002                  RTA    CDUIR         NO - RETURN
          564 00124    292  2 140000C4 CDU21            LDA    058
          565 00126    294  2 8402001F                  AND    31,M          GET PUSHBUTTON SWITCHES
          566 00128    296  2 E4020019                  SBU    25,M          HAS ALIGN STARTED
          567 0012A    298  2 6108                      JN     CDU31         NO - RETURN
GENERATED                         0700
          568 0012C    300  2 1400000A CDU30            LDA    ONE           YES - PREPARE TO CALL FENT
          569 0012E    302  2 3C000006                  STA    CDUS1         CDUS1=1
          570 00130    304  2 64040000                  JS     FENT          INITIALIZE FOR ALIGN - PUT
                                             *                               'CALL ALIGN' IN VECT
          571 00132    306  2 74000002 CDU31            RTA    CDUIR         RETURN
                                             *
          572 00134    308  2 64180140 CDU40            JGW    CDU41,0
          573 00136    310  2 54006FF6                  LDB    I3F           GET SWITCHES FROM SIDL
          574 00138    312  2 0810                      SLLD   16            SHIFT MODE SWITCH TO 'A' REGISTER
GENERATED                         0700
          575 0013A    314  2 84000014                  AND    SEVEN         MASK OUT GARBAGE
          576 0013C    316  2 3C00006C                  STA    MODE          MODE=MODE FIELD FROM SIDL
          577 0013E    318  2 74000002                  RTA    CDUIR         RETURN
                                             *
          578 00140    320  2 6498014A CDU41            JGW    CDU42,1
          579 00142    322  2 0700                      NOP
          580 00143    323  2      0700                 NOP
          581 00144    324  2 0700                      NOP
          582 00145    325  2      0700                 NOP
          583 00146    326  2 0700                      NOP
```

VERSION M2040503 DECK NAME=*RTEXEC*

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
                                          *
                                          *     PDP-11 SUPPLIED MODE PICKED UP HERE
                                          *
GENERATED                                0700
            584 00148    328  2 74000002          RTA     CDUIR          RETURN
                                          *
            585 0014A    330  2 65180152 CDU42     JSW     CDU43,2
            586 0014C    332  2 14000010          LDA     FOUR
            587 0014E    334  2 3C00006C          STA     MODE           MODE=4; ENTER ALIGN
            588 00150    336  2 74000002          RTA     CDUIR          RETURN
                                          *
            589 00152    338  2 1400000E CDU43    LDA     THREE
            590 00154    340  2 3C00006C          STA     MODE           MODE=3; ENTER NAV
            591 00156    342  2 74000002          RTA     CDUIR
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                          PAGE  17

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            593                                   EVEN
                                          *
                                          *    INTERRUPT 10 ROUTINE. PROCESSES 32 HZ INTERRUPT.
                                          *
            594 00158    344  2 DC01000A INT10    STS        DMASAV      *SAVE S
            595 0015A    346  2 3C00000C          STA        DMASAV+2    *SAVE A
            596 0015C    348  2 7C00000E          STB        DMASAV+4     *SAVE B
            597 0015E    350  2 6448017E          JGF        NOTRED+1    *TEST FOR DMA NOT READY
            598 00160    352  2 140000DE          LDA        POCC1
            599 00162    354  2 4820              DOA        4           *START DMA OUTPUT
GENERATED                             0700
            600 00164    356  2 140000E2          LDA        PICC1
            601 00166    358  2 4828              DOA        5           *START DMA INPUT
GENERATED                             0700
            602 00168    360  2 1400000A          LDA        DMASAV
            603 0016A    362  2 C4000010          LOR    B9              SET NOT READY FLAG
            604 0016C    364  2 3C00000A          STA        DMASAV
            605 0016E    366  2 14000014          LDA      DMAERR
            606 00170    368  2 84020010          AND      16,M
            607 00172    370  2 3C000014          STA        DMAERR      *RESET DMA STATUS WORD
            608 00174    372  2 0700              NOP
            609 00175    373  2     0700          NOP
            610 00176    374  2 1400000C I10END   LDA        DMASAV+2    *RESTORE A,B,S
            611 00178    376  2 5400000E          LDB        DMASAV+4    *
            612 0017A    378  2 9C01000A          LDS        DMASAV      *
            613 0017C    380  2 74007FF4          RTA        RET10
                                          *
                                          *    INTERRUPT 10 INITIALIZATION OR FIXUP
                                          *
            614 0017E    382  2 A400000A NOTRED   ADU      ONE             CLEAR CARRY BIT
            615 00180    384  2 14000016          LDA      ERRCNT
            616 00182    386  2 A4020001          ADU        1,M         *INCREMENT ERROR COUNT
            617 00184    388  2 3C000016          STA        ERRCNT
            618 00186    390  2 5402000F          LDB        15,M        *BEGIN SETTING OF DMA STATUS
            619 00188    392  2 4822              DIA        4
GENERATED                             0700
            620 0018A    394  2 8C000000          SAM        B1          * TEST FOR OEOT1
            621 0018C    396  2 64300193          JGU        NRD1
            622 0018E    398  2 0500              EAB
GENERATED                             0700
            623 00190    400  2 8402001E          AND      30,M            RESET SODL ERROR BIT
            624 00192    402  2 0500              EAB
            625 00193    403  2     482A NRD1     DIA        5
            626 00194    404  2 8C000002          SAM        B2          *TEST FOR IEOT2
            627 00196    406  2 6430019E          JGU        NRD2
            628 00198    408  2 0500              EAB
GENERATED                             0700
            629 0019A    410  2 8402001D          AND      29,M            RESET SIDL TORQUE ERROR BIT
            630 0019C    412  2 0500              EAB
GENERATED                             0700
            631 0019E    414  2 8C000004 NRD2     SAM        B3          *TEST FOR IEOT3
            632 001A0    416  2 643001A8          JGU        NRD3
            633 001A2    418  2 0500              EAB
GENERATED                             0700
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                          PAGE  18

DIAGNOSTICS LINE ADRES OADRES LC  PROGRAM                                   SOURCE
            634 001A4    420  2 8402001B          AND    27.M          RESET LAST SIDL ERROR BIT
            635 001A6    422  2 0500              EAB
GENERATED                         0700
            636 001A8    424  2 7C000014 NRD3     STB       DMAERR
            637 001AA    426  2 140000E6          LDA       PCCRST      *START DMA INITIALIZATION
            638 001AC    428  2 4820              DOA       4
            639 001AD    429  2      4828         DOA       5
            640 001AE    430  2 140000F0          LDA       POC2
            641 001B0    432  2 3C007FC2          STA       APOIC+2
            642 001B2    434  2 140000E0          LDA       POCC2
            643 001B4    436  2 4820              DOA       4           *START SCB PROG. CONT. RESET
GENERATED                         0700
            644 001B6    438  2 140000EE          LDA       POC1
            645 001B8    440  2 3C007FC0          STA       APOIC
            646 001BA    442  2 140000F2          LDA       PIC2
            647 001BC    444  2 3C007FCA          STA       APOIC+10
            648 001BE    446  2 140000F4          LDA       PIC3
            649 001C0    448  2 3C007FCC          STA       APOIC+12
            650 001C2    450  2 4822      NRD4    DIA       4
GENERATED                         0700
            651 001C4    452  2 8C000002          SAM       B2          *CHECK FOR OEOT2
            652 001C6    454  2 643001C2          JGU       NRD4
            653 001C8    456  2 140000E6          LDA       PCCRST
            654 001CA    458  2 4820              DOA       4
GENERATED                         0700
            655 001CC    460  2 140000F0          LDA       POC2
            656 001CE    462  2 3C007FC2          STA       APOIC+2
            657 001D0    464  2 1400000A          LDA       DMASAV
            658 001D2    466  2 840000EC          AND       FG1ZER      *RESET NOT READY FLAG
            659 001D4    468  2 3C00000A          STA       DMASAV
            660 001D6    470  2 14000016          LDA    ERRCNT
            661 001D8    472  2 6102              JN     NRD5          IS ERRCNT .GT. 0
            662 001D9    473  2      60E3*        JU     I10END
            663 001DA    474  2 1400004A NRD5     LDA    CYLE
            664 001DC    476  2 A400000C          ADU    TWO
            665 001DE    478  2 3C00004A          STA    CYLE          CYLE=CYLE+2
            666 001E0    480  2 14000032          LDA    EXNO
            667 001E2    482  2 61EC              JN     I10END        IS EXNO NON - ZERO
GENERATED                         0700
            668 001E4    484  2 34007836          LAE    EX30
            669 001E6    486  2 3C007FF4          STA    RET10         SET RETURN TO CALL EXECUTIVE
            670 001E8    488  2 60F2              JU     I10END
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                                    PAGE  19

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
GENERATED                            0700
             672                                         EVEN
                                              *
                                              *    INTERRUPT 5 ROUTINE. PROCESSES DMA INPUT COMPLETE INTERRUPT.
                                              *
             673 001EA      490  2 DC010010 INT05       STS       DMASAV+6     *SAVES S
             674 001EC      492  2 0100                 DPI
GENERATED                            0700
             675 001EE      494  2 3C00000A             STA       DMASAV       *SAVE A
             676 001F0      496  2 7C00000C             STB       DMASAV+2     *SAVE B
             677 001F2      498  2 482A                 DIA       5
GENERATED                            0700
             678 001F4      500  2 3C00000E             STA       DMASAV+4     *SAVE DMA INPUT STATUS
             679 001F6      502  2 8C000006             SAM       FAILMS       *TEST FOR NON-EOT
             680 001F8      504  2 64300212             JGU       ISEOT
             681 001FA      506  2 A400000A             ADD     ONE            CLEAR CARRY BIT
             682 001FC      508  2 14000016             LDA       ERRCNT
             683 001FE      510  2 A4020001             ADD       1,M          *INCREMENT ERROR COUNT
             684 00200      512  2 3C000016             STA       ERRCNT
             685 00202      514  2 14000014             LDA       DMAERR
             686 00204      516  2 C4020002             LOR       2,M          *SET SIDL TORK ERROR BIT
             687 00206      518  2 3C000014             STA       DMAERR
             688 00208      520  2 1400000E             LDA       DMASAV+4
             689 0020A      522  2 CC000002             EXO       B2
             690 0020C      524  2 840000EB             AND       MSK1
             691 0020E      526  2 C40000EA             LOR       MSK2
             692 00210      528  2 4828                 DOA       5            *RESET NON-EOT INTERRUPT
GENERATED                            0700
             693 00212      530  2 1400000E ISEOT       LDA       DMASAV+4
             694 00214      532  2 8C000002             SAM       B2           *TEST FOR IEOT2
             695 00216      534  2 64300224             JGU       ISEND
             696 00218      536  2 140000E4             LDA       PICC2
             697 0021A      538  2 4828                 DOA       5            *MODIFY INPUT CONTROL WORD
GENERATED                            0700
             698 0021C      540  2 14000014             LDA       DMAERR
             699 0021E      542  2 8402001D             AND     29,M           RESET SIDL TORK ERROR BIT
             700 00220      544  2 3C000014             STA       DMAERR
             701 00222      546  2 64040000             JS        TORK
             702 00224      548  2 1400000A ISEND       LDA       DMASAV       *RESTORE  A,B,S
             703 00226      550  2 5400000C             LDB       DMASAV+2     *
             704 00228      552  2 9C010010             LDS       DMASAV+6     *
             705 0022A      554  2 74007FEA             RTA       RET05
             706                                        EVEN
                                              *
```

```
VERSION K20A0503      DECK NAME=*FTEXEC*                                                      PAGE  20

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
                                          *    INTERRUPT 4 ROUTINE. PROCESSES DMA OUTPUT COMPLETE INTERRUPT.
                                          *
            708 0022C     556  2 DC010012 INT04    STS      DMASAV+8     *SAVE S
            709 0022E     558  2 0100              DPI
GENERATED                          0700
            710 00230     560  2 3C00000A          STA      DMASAV       *SAVE A
            711 00232     562  2 7C00000C          STB      DMASAV+2     *SAVE B
            712 00234     564  2 4822              DIA      4
GENERATED                          0700
            713 00236     566  2 3C00000E          STA      DMASAV+4     *SAVE DMA OUTPUT STATUS
            714 00238     568  2 8C0000D6          SAM      FAILMS       *TEST FOR NON-EOT INTERRUPT
            715 0023A     570  2 64300252          JGU      I4EOT
            716 0023C     572  2 840000E8          AND      MSK1
            717 0023E     574  2 CC000002          EXO      B2
            718 00240     576  2 C40000EA          LOR      MSK2
            719 00242     578  2 4820              DOA      4            *ERROR INTERRUPT RESET
GENERATED                          0700
            720 00244     580  2 A400000A          ADU    ONE           CLEAR CARRY BIT
            721 00246     582  2 14000016          LDA      ERRCNT
            722 00248     584  2 A4020001          ADU      1,M         *INCREMENT ERROR COUNT
            723 0024A     586  2 3C000016          STA      ERRCNT
            724 0024C     588  2 14000014          LDA      DMAERR
            725 0024E     590  2 C4020001          LOR      1,M          *SET SODL ERROR BIT
            726 00250     592  2 3C000014          STA      DMAERR
            727 00252     594  2 1400000E I4EOT    LDA      DMASAV+4
            728 00254     596  2 8C000000          SAM      B1           *TEST FOR OEOT1
            729 00256     598  2 643002A2          JGU      I4END
            730 00258     600  2 14000014          LDA      DMAERR
            731 0025A     602  2 8402001E          AND    30,M          RESET SODL ERROR BIT
            732 0025C     604  2 3C000014          STA      DMAERR
            733 0025E     606  2 482A              DIA      5
GENERATED                          0700
            734 00260     608  2 8C000004          SAM      B3           *TEST FOR IEOT3
            735 00262     610  2 6430026C          JGU      I4EOT1
            736 00264     612  2 14000014          LDA      DMAERR
            737 00266     614  2 84020013          AND    19,M          RESET DMA ERROR BITS
            738 00268     616  2 3C000014          STA      DMAERR
            739 0026A     618  2 600E              JU       I4EOT2
GENERATED                          0700
            740 0026C     620  2 14000014 I4EOT1   LDA      DMAERR
            741 0026E     622  2 C4020004          LOR      4,M          *SET LAST SIDL ERROR BIT
            742 00270     624  2 3C000014          STA      DMAERR
            743 00272     626  2 14000016          LDA      ERRCNT
            744 00274     628  2 A4020001          ADU      1,M          *INCREMENT ERROR COUNT
            745 00276     630  2 3C000016          STA      ERRCNT
            746 00278     632  2 140000E6 I4EOT2   LDA      PCCRST       *RE-INITIALIZE DMA
            747 0027A     634  2 4820              DOA      4
            748 0027B     635  2     4828          DOA      5
            749 0027C     636  2 140000EE          LDA      POC1
            750 0027E     638  2 3C007FC0          STA      APOIC
            751 00280     640  2 140000F0          LDA      POC2
            752 00282     642  2 3C007FC2          STA      APOIC+2
            753 00284     644  2 140000F2          LDA      PIC2
            754 00286     646  2 3C007FCA          STA      APOIC+10
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                              PAGE  21

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                     SOURCE
             755 00288   648  2 140000F4            LDA      PIC3
             756 0028A   650  2 3C007FCC            STA      APOIC+12
             757 0028C   652  2 14000012            LDA      DMASAV+8
             758 0028E   654  2 840000EC            AND      FGIZER        *RESET DMA NOT READY FLAG
             759 00290   656  2 3C000012            STA      DMASAV+8
             760 00292   658  2 14000032            LDA      EXNO          *BEGIN EXNO TEST
             761 00294   660  2 6108                JN       I4EXNO
GENERATED                          0700
             762 00296   662  2 34007836            LAE   EX30            SET RETURN TO CALL EXECUTIVE
             763 00298   664  2 3C007FE8            STA      RET04         *MODIFY RTA PTR FOR EXEC
             764 0029A   666  2 6008                JU       I4END
GENERATED                          0700
             765 0029C   668  2 1400004A I4EXNO     LDA   CYLE
             766 0029E   670  2 A400000A            ADD   ONE
             767 002A0   672  2 3C00004A            STA   CYLE            CYLE = CYLE+1
             768 002A2   674  2 1400000A I4END      LDA      DMASAV        *RESTORE A,B,S
             769 002A4   676  2 5400000C            LDB      DMASAV+2
             770 002A6   678  2 9C010012            LDS      DMASAV+8
             771 002A8   680  2 74007FE8            RTA      RET04
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                              PAGE  22

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                       SOURCE
                                          *
                                          *   SUBROUTINE BDSI. INITIALIZE BUILT-IN TEST,DATA DECODE,AND
                                          *   AUTO SEQUENCING.
                                          *
            773                  2           ,     USE    2
            774                                    ENTRY  BDSI
            775                                    EVEN
            776 002AA      682  2 00000000 BDSI    PTR    BDSIR
            777 002AC      684  2 1400001C         LDA    ZERO
                                          *
                                          *   BLP1=BLP2=BLP3=BLP4=0; BCTR=BNBR=HCTR=0; HOLD=MALF=MLFN=0;
                                          *   CMD1=CMD2=CMD3=CMD4=0; BER1=BER2=BER3=BER4=0
                                          *
            778 002AE      686  2 5C2A0022         LDX    5,34,M
            779 002B0      688  2 3E800018 BDSI1   STA    BLP1,5
            780 002B2      690  2 6C2B0002         IMN    5,2,M
            781 002B4      692  2 643002B0         JGU    BDSI1
                                          *
                                          *   SET INITIAL VALUES OF BDS(I) AND BMK(I) I=1,4, FROM TABLE BTIN
                                          *
            782 002B6      694  2 5C2A000E         LDX    5,14,M
            783 002B8      696  2 16800016 BDSI2   LDA    BTIN,5
            784 002BA      698  2 3E800000         STA    BDS1,5         BDS(I)=BTIN(I)  I=1,4
            785 002BC      700  2 6C2B0002         IMN    5,2,M          BMK(I)=BTIN(I+4)  I=1,4
            786 002BE      702  2 643002B8         JGU    BDSI2
                                          *
                                          *   SRT1=SRT2=RATP=RATM=0; ROT1=ROT2=0; DVXG=DVYG=DVZG=0;
                                          *   DPVV=DPDV=DPHV=0; GMT=0; BTE1=BTE2=BTE3=BTE4=0;
                                          *   R1CT=R2CT=CIPM=RAT=RATL=0; DVX=DVY=DVZ=0; CYLE=VRTV=DRFV=HDGV=0
                                          *
            787 002C0      704  2 1400001C         LDA    ZERO
            788 002C2      706  2 5C2A0050         LDX    5,80,M
            789 002C4      708  2 3E800000 BDSI4   STA    SRT1,5
            790 002C6      710  2 6C2B0002         IMN    5,2,M
            791 002C8      712  2 643002C4         JGU    BDSI4
                                          *
                                          *   CTR1=CTR2=CTR3=0; TIME=ITER=PHAS=0; NAVF=DATA=PUSH=TEST=0
                                          *
            792 002CA      714  2 5C2A0014         LDX    5,20,M
            793 002CC      716  2 3E800052 BDSI5   STA    CTR1,5
            794 002CE      718  2 6C2B0002         IMN    5,2,M
            795 002D0      720  2 643002CC         JGU    BDSI5
            796 002D2      722  2 14000026         LDA    KLIT
            797 002D4      724  2 3C00006E         STA    LITE           LITE=KLIT
            798 002D6      726  2 1400001C         LDA    ZERO
            799 002D8      728  2 3C0100AD         STAH   014+1          014 DATA = 0
            800 002DA      730  2 3C0100CB         STAH   025+1          025 DATA = 0
            801 002DC      732  2 54006FF6         LDB    I3F            PICK UP SWITCHES FROM SIDL
            802 002DE      734  2 0810             SLLD   16             SHIFT MODE SWITCH TO 'A' REGISTER
GENERATED                           0700
            803 002E0      736  2 84000014         AND    SEVEN          MASK OUT GARBAGE
            804 002E2      738  2 3C00006C         STA    MODE           MODE = MODE SWITCH FROM SIDL
            805 002E4      740  2 14000010         LDA    DECDJM
            806 002E6      742  2 3C000176         STA    VECT+2         2ND ENTRY OF VECT = 'CALL DECD'
```

VERSION K20A0503 DECK NAME=*RTEXEC*


```
DIAGNOSTICS LINE ADRES OADRES LC  PROGRAM                              SOURCE
              807 002E8    744  2 14000014          LDA    SPINJM
              808 002EA    746  2 3C00017C          STA    VECT+8      5TH ENTRY OF VECT=SPIN
              809 002EC    748  2 1400000E          LDA    BITEJM
              810 002EE    750  2 3C000180          STA    VECT+12     7TH ENTRY OF VECT=BITE
              811 002F0    752  2 14000012          LDA    GASCJM
              812 002F2    754  2 3C00018E          STA    VECT+26     14TH ENTRY OF VECT=GASC
                                 *
                                 *     INITIALIZE SODL DATA AREA
                                 *
              813 002F4    756  2 5C2A007E          LDX    5,126,M     INITIALIZE COUNTER
              814 002F6    758  2 16A00028 BDSI6     LDA    SODLIN,5
              815 002F8    760  2 3EA00072          STA    SODL,5      SODL(N)=SODLIN(N)
              816 002FA    762  2 6C2B0002          IMN    5,2,M       DECREMENT COUNTER
              817 002FC    764  2 643002F6          JGU    BDSI6       GO BACK FOR ANOTHER
              818 002FE    766  2 74000000          RTA    BDSIR
                                 *
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                                      PAGE  24

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
                                          *
                                          *          SUBROUTINE DECD (DECODE)
                                          *
                                          *     THIS ROUTINE UNPACKS THE SERIAL DATA BUS (SIDL) INPUTS AND
                                          *     STORES THESE VALUES FOR USE BY OTHER PROGRAMS. THE BITE BITS
                                          *     ARE REPACKED FOR USE BY THE BITE ROUTINE. DIAGNOSTIC CHECKS ARE
                                          *     USED FOR VERIFICATION OF ROTOR SPEED AND DELTA V'S.
                                          *
                                          *
            820                2                      USE    2
            821                                       ENTRY  DECD
            822                                       EVEN
            823 00300    768   2 00000004 DECD        PTR    DECDR
            824 00302    770   2 1400001C             LDA    ZERO
            825 00304    772   2 3C000032             STA    BTE3          BTE3=BTE4=0
            826 00306    774   2 3C000016             STA    TEMP2         PREPARE TO RESET TORQUING TIMER
            827 00308    776   2 14000012             LDA    LPTK
            828 0030A    778   2 0841                 SLL    1             LPTK*2
GENERATED                            0700
            829 0030C    780   2 3C000012             STA    LPTK          LPTK=LPTK*2
            830 0030E    782   2 540100B1             LDBH   071+1         PREPARE TORQUING COMMANDS TO CHECK
                                          *                                FOR MAX TORQUING
            831 00310    784   2 140000AE             LDA    072
            832 00312    786   2 0810                 SLLD    16           PUT BOTH WORDS IN A REG.
GENERATED                            0700
            833 00314    788   2 3C000014             STA    TEMP          (A) = TORQUING COMMANDS
            834 00316    790   2 CC000008             EXO    NONE          COMPLEMENT TORQUE TIMER
            835 00318    792   2 0841                 SLL    1
GENERATED                            0700
            836 0031A    794   2 CC000014             EXO    TEMP          CHECK TO SEE IF BIT1 = BIT2
            837 0031C    796   2 840000B0             AND    MSBMSK
            838 0031E    798   2 6102                 JN     D003
            839 0031F    799   2       6013           JU     D005
            840 00320    800   2 14000012 D003        LDA    LPTK
            841 00322    802   2 A400000A             ADU    ONE
            842 00324    804   2 3C000012             STA    LPTK          SET TORQUING BIT
            843 00326    806   2 14000034             LDA    GSCT
            844 00328    808   2 E40000AC             SBU    S1A32         GSCT-1.03125
            845 0032A    810   2 620E                 JG     D007          CHECK FOR GSCT .GT. 1 MINUTE
GENERATED                            0700
            846 0032C    812   2 14000034             LDA    GSCT
            847 0032E    814   2 A400000A             ADU    ONE           GSCT=GSCT+1/32  (ONE=SCLB  0.03125)
            848 00330    816   2 3C000016             STA    TEMP2
            849 00332    818   2 14000016 D005        LDA    TEMP2         ADVANCE/RESET TORQUING TIMER
            850 00334    820   2 3C000034             STA    GSCT          GSCT=TEMP2
            851 00336    822   2 6008                 JU     D009
GENERATED                            0700
            852 00338    824   2 14000032 D007        LDA    BTE3
            853 0033A    826   2 C4000004             LOR    B3            SET GIMBAL STUCK BIT
            854 0033C    828   2 3C000032             STA    BTE3
            855 0033E    830   2 14006FE0 D009        LDA    I4F           CHECK TURN AROUND WORD
            856 00340    832   2 E4000072             SBU    04F
            857 00342    834   2 6102                 JN     D010
            858 00343    835   2       6007           JU     D011
```

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            859 00344    836  2 14000032 D010     LDA   BTE3
            860 00346    838  2 C400000A          LOR   ONE              BTE4=1
            861 00348    840  2 3C000032          STA   BTE3
            862 0034A    842  2 5C2A0000 D011     LDX   5,0,M
            863 0034C    844  2 14010033 D015     LDAH  BTE3+1
            864 0034E    846  2 0841              SLL   1                BTE4*2
GENERATED                          0700
            865 00350    848  2 3C010033          STAH  BTE3+1
            866 00352    850  2 16816FE2          LDAH  SIDL,5           LOAD UPPER HALF OF SIDL WORD
            867 00354    852  2 840000CA          AND   FF               MASK OFF UFC FIELD
            868 00356    854  2 3C000014          STA   TEMP
            869 00358    856  2 16810072          LDAH  SODL,5           LOAD UPPER HALF OF SODL WORD
            870 0035A    858  2 0848              SLL   8                ALIGN UFC FIELD WITH SIDL
GENERATED                          0700
            871 0035C    860  2 E4000014          SBU   TEMP
            872 0035E    862  2 6102              JN    D016             ARE UFC FIELDS EQUAL
            873 0035F    863  2      6007         JU    D017
            874 00360    864  2 14000032 D016     LDA   BTE3
            875 00362    866  2 A400000A          ADD   ONE              BTE4=BTE4+1
            876 00364    868  2 3C000032          STA   BTE3
            877 00366    870  2 6C2A0002 D017     IMP   5,2,M
            878 00368    872  2 2428001C          ICL   5,28,M
            879 0036A    874  2 6430036E          JGU   D020
            880 0036C    876  2 6430034C          JGU   D015
            881 0036E    878  2 1400001C D020     LDA   ZERO
            882 00370    880  2 3C0100C7          STAH  050+1            CLEAR BITE BITS
            883 00372    882  2 0100              DPI                    DISABLE PROGRAM INTERRUPTS
GENERATED                          0700
            884 00374    884  2 1400004A          LDA   CYLE
            885 00376    886  2 6102              JN    D021             CYLE.NE.0
            886 00377    887  2      6015         JU    D023             CYLE=0
            887 00378    888  2 E400000C D021     SBU   TWO              IS CYLE .GT. 1
            888 0037A    890  2 6308              JL    D022             NO - GO SET OUT OF TIME FLAG
GENERATED                          0700
            889 0037C    892  2 14020010          LDA   16,M
            890 0037E    894  2 C4000014          LOR   DMAERR           SET CYLE .GT. 2 FLAG
            891 00380    896  2 3C000014          STA   DMAERR
            892 00382    898  2 14010033 D022     LDAH  BTE3+1
            893 00384    900  2 C4000000          LOR   B1
            894 00386    902  2 3C010033          STAH  BTE3+1           SET OUT OF TIME FLAG
            895 00388    904  2 1400001C          LDA   ZERO
            896 0038A    906  2 3C00004A          STA   CYLE             CYLE=0
            897 0038C    908  2 0200      D023    EPI                    ENABLE PROGRAM INTERRUPTS
GENERATED                          0700
            898 0038E    910  2 1400002E          LDA   GMT+2
            899 00390    912  2 5400002C          LDB   GMT
            900 00392    914  2 9C000034          AFD   D1032            GMT=GMT+0.03125 SEC/ND
            901 00394    916  2 3C00002E          STA   GMT+2
            902 00396    918  2 7C00002C          STB   GMT
            903 00398    920  2 0400              CFX                    FIX GMT
GENERATED                          0700
            904 0039A    922  2 7C010077          STBH  041+1            041 DATA = LEAST SIGNIFICANT PART OF GMT
            905 0039C    924  2 0870              SRLD  16
GENERATED                          0700
            906 0039E    926  2 7C010075          STBH  040+1            040 DATA = MOST SIGNIFICANT PART OF GMT
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            907 003A0   928  2 14000058          LDA    TIME+2
            908 003A2   930  2 54000058          LDB    TIME
            909 003A4   932  2 9C000034          AFD    D1032       TIME = TIME + 0.03125 SECOND
            910 003A6   934  2 3C00005A          STA    TIME+2
            911 003A8   936  2 7C000058          STB    TIME
            912 003AA   938  2 0400              CFX                FIX TIME
GENERATED                          0700
            913 003AC   940  2 7C010061          STBH   ITER+1      (B)=MODULO 1 SECOND
            914 003AE   942  2 14000072          LDA    04F         PICK UP TURN AROUND WORD
            915 003B0   944  2 0C65              SRC    5           GET RID OF OLD ITER
            916 003B1   945  2      0805         SLLD   5           PICK UP NEW ITER
            917 003B2   946  2 3C000072          STA    04F
            918 003B4   948  2 14000060          LDA    ITER
            919 003B6   950  2 0C68              SRC    11          RIGHT JUSTIFY ITER
GENERATED                          0700
            920 003B8   952  2 3C000060          STA    ITER
            921 003BA   954  2 54016FF7          LDBH   13F+1       GET LOW ORDER HALF WORD
            922 003BC   956  2 0801              SLLD   1           PACK IT
GENERATED                          0700
            923 003BE   958  2 14016FF6          LDAH   13F         GET HIGH ORDER HALF WORD
            924 003C0   960  2 84000082          AND    SWMSK       GET RID OF UNWANTED BITS
            925 003C2   962  2 0C70              SRC    16          PACK HIGH ORDER HALF WORD
            926 003C3   963  2      086A         SRLD   10
            927 003C4   964  2 7C0100C5          STBH   058+1       058 DATA = CDU SWITCHES
            928 003C6   966  2 14010033          LDAH   BTE3+1
            929 003C8   968  2 84000018          AND    B13         CHECK ALT UNREASONABLE BIT
            930 003CA   970  2 6160              JN     D050
GENERATED                          0700
            931 003CC   972  2 540100C5          LDBH   058+1       LOAD 058 DATA INTO B REGISTER
            932 003CE   974  2 0804              SLLD   4           LEFT JUSTIFY DATA BITS
GENERATED                          0700
            933 003D0   976  2 14000020          LDA    DATI
            934 003D2   978  2 3C000014          STA    TEMP
            935 003D4   980  2 0803              SLLD   3           DATI=DATI*8+058 BITS 20-22
GENERATED                          0700
            936 003D6   982  2 84027FFF          AND    32767,M     DATI.AND.7FFF HEX
            937 003D8   984  2 3C000020          STA    DATI
            938 003DA   986  2 E4000014          SBU    TEMP
            939 003DC   988  2 6108              JN     D030        DOES TEMP=DATI
GENERATED                          0700
            940 003DE   990  2 14000020          LDA    DATI
            941 003E0   992  2 84020007          AND    7,M         YES: DATA=DATI.AND.7
            942 003E2   994  2 3C000066          STA    DATA
            943 003E4   996  2 140000C4 0030     LDA    058
            944 003E6   998  2 84020020          AND    32,M
            945 003E8  1000  2 3C00006A          STA    TEST        TEST = PRESS-TO-TEST-BIT
            946 003EA  1002  2 140000C4          LDA    058
            947 003EC  1004  2 8402001F          AND    31,M        (A) = PUSHBUTTON SWITCH
            948 003EE  1006  2 6102              JN     D031        IS (A)=0
            949 003EF  1007  2      6003         JU     D032
            950 003F0  1008  2 3C000068 0031     STA    PUSH        YES: PUSH=(A)
            951 003F2  1010  2 E4020019 0032     SBU    25,M        CHECK MODE START SWITCH
            952 003F4  1012  2 3C000070          STA    TMPR        SAVE FOR FUTURE REFERENCE
            953 003F6  1014  2 A4020006          ADU    6,M         HAS DATA SWITCH BEEN PRESSED (19)
            954 003F8  1016  2 6102              JN     D033
```

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VERSION K2040503      DECK NAME=*RTEXEC*                                                              PAGE  27

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                     SOURCE
             955 003F9   1017 2       6003            JU     D034
             956 003FA   1018 2 14020100 D033         LDA    256.M          (A).NE.0 SO (A)=256=(B8)
             957 003FC   1020 2 CC020180 D034         EXO    384.M          (A)=(A).XOR. 384
             958 003FE   1022 2 C400006E              LOR    LITE
             959 00400   1024 2 CC020180              EXO    384.M
             960 00402   1026 2 3C00006E              STA    LITE           TURN OFF LITE BITS 12 AND 13
             961 00404   1028 2 0803                  SLLD   3              GET MODE SWITCH FROM B REGISTER
GENERATED                            0700
             962 00406   1030 2 84000014              AND    SEVEN          CLEAR OUT GARBAGE
             963 00408   1032 2 06C0                  LXA    8              (XR8)=NEW MODE
GENERATED                            0700
             964 0040A   1034 2 2440006C              ICN    8.MODE         IS NEW MODE = MODE
             965 0040C   1036 2 6430042A              JGU    D050           YES - DO NOT CHANGE MODE SWITCH
             966 0040E   1038 2 24430006              ICL    8.6.M          IS NEW MODE .GE.6
             967 00410   1040 2 64300424              JGU    D040           YES - TURN ON MODE START LITE
             968 00412   1042 2 24420001              ICN    8.1.M          IS NEW MODE = 1
             969 00414   1044 2 64300424              JGU    D040           YES - TURN ON MODE START LITE
             970 00416   1046 2 24430001              ICL    8.1.M          IS NEW MODE .LT. 1
             971 00418   1048 2 6430041C              JGU    D035           NO - GO CHECK MODE START SWITCH
             972 0041A   1050 2 6430042A              JGU    D050           YES - DO NOT CHANGE MODE SWITCH
             973 0041C   1052 2 14000070 D035         LDA    TMPR           HAS MODE STARTED
             974 0041E   1054 2 6106                  JN     D040           NO - TURN ON MODE START LITE
GENERATED                            0700
             975 00420   1056 2 1C40006C              STX    8.MODE         STORE NEW MODE SWITCH
             976 00422   1058 2 6008                  JU     D050
GENERATED                            0700
             977 00424   1060 2 14020080 D040         LDA    128.M
             978 00426   1062 2 C400006E              LOR    LITE
             979 00428   1064 2 3C00006E              STA    LITE           TURN ON MODE START LIGHT
             980 0042A   1066 2 14016FEE D050         LDAH   I77
             981 0042C   1068 2 84000086              AND    RATMS1         MASK OFF R.A.T. FIELD
             982 0042E   1070 2 0849                  SLL    9             SHIFT TO PROPER LOCATION
GENERATED                            0700
             983 00430   1072 2 3C000014              STA    TEMP
             984 00432   1074 2 14006FF2              LDA    I22
             985 00434   1076 2 840000D8              AND    00FF           MASK OFF VERTICAL VELOCITY
             986 00436   1078 2 0841                  SLL    1              SHIFT TO PROPER LOCATION
GENERATED                            0700
             987 00438   1080 2 C4000014              LOR    TEMP           INSERT IN WORD
             988 0043A   1082 2 3C010085              STAH   04E+1          STORE IN 04E DATA
             989 0043C   1084 2 14016FEF              LDAH   I77+1
             990 0043E   1086 2 3C010083              STAH   04D+1          04D DATA = ROTOR SPEED
             991 00440   1088 2 14016FEE              LDAH   I77
             992 00442   1090 2 84000010              AND    B9             MASK OFF RAT-BITE BIT
             993 00444   1092 2 0C66                  SRC    6              SHIFT TO PROPER LOCATION
GENERATED                            0700
             994 00446   1094 2 3C000014              STA    TEMP           SAVE IT
             995 00448   1096 2 14016FE8              LDAH   I74            PICK UP I74
             996 0044A   1098 2 8400008C              AND    TEMSK          MASK OF  TEMPERATURE BITE
             997 0044C   1100 2 0844                  SLL    4              SHIFT TO PROPER LOCATION
GENERATED                            0700
             998 0044E   1102 2 C4000014              LOR    TEMP
             999 00450   1104 2 3C000014              STA    TEMP
            1000 00452   1106 2 14016FE6              LDAH   I73
            1001 00454   1108 2 8400008E              AND    IMUMSK         MASK OFF IMU BITE
```

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VERSION K20A0503      DECK NAME=*HTEXEC*                                                        PAGE  28

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                SOURCE
            1002 00456   1110  2 084C              SLL     12           SHIFT TO RIGHT POSITION
GENERATED                            0700
            1003 00458   1112  2 C4000014          LOR     TEMP         INSERT IN TEMP
            1004 0045A   1114  2 3C000014          STA     TEMP
            1005 0045C   1116  2 14016FF1          LDAH    I21+1
            1006 0045E   1118  2 8400000C          AND     B7           MASK OFF DOPPLER RELIABLE BIT
            1007 00460   1120  2 0C69              SRC     9           SHIFT TO RIGHT POSITION
GENERATED                            0700
            1008 00462   1122  2 C4000014          LOR     TEMP
            1009 00464   1124  2 3C0100C7          STAH    05D+1        PUT WORD IN 05D DATA
            1010 00466   1126  2 14015FF1          LDAH    I21+1
            1011 00468   1128  2 840000C0          AND     BTEMSK       MASK OFF BITE BITS
            1012 0046A   1130  2 0C66              SRC     6            SHIFT TO RIGHT POSITION
GENERATED                            0700
            1013 0046C   1132  2 3C000014          STA     TEMP
            1014 0046E   1134  2 14016FF0          LDAH    I21
            1015 00470   1136  2 84000008          AND     00FF         MASK OFF BAROMETRIC ALTITUDE
            1016 00472   1138  2 0848              SLL     8            SHIFT TO RIGHT POSITION
GENERATED                            0700
            1017 00474   1140  2 C4000014          LOR     TEMP
            1018 00476   1142  2 3C0100C5          STAH    025+1        STORE IN 025 DATA
            1019 00478   1144  2 14016FF3          LDAH    I22+1
            1020 0047A   1146  2 3C0100CD          STAH    060+1        060 DATA = DRIFT AND HEADING
            1021 0047C   1148  2 14016FEC 0090     LDAH    I76
            1022 0047E   1150  2 84000008          AND     00FF         MASK OFF -DVX
            1023 00480   1152  2 0848              SLL     8
GENERATED                            0700
            1024 00482   1154  2 3C010014          STAH    TEMP         SAVE IT
            1025 00484   1156  2 14015FEA          LDAH    I75
            1026 00486   1158  2 84000008          AND     00FF         MASK OFF +DVX
            1027 00488   1160  2 C4000014          LOR     TEMP         INSERT IT
            1028 0048A   1162  2 3C0100B7          STAH    050+1        STORE IN 050 DATA
            1029 0048C   1164  2 14016FED          LDAH    I76+1
            1030 0048E   1166  2 840000CA          AND     FF           MASK OFF -DVY
            1031 00490   1168  2 3C010014          STAH    TEMP
            1032 00492   1170  2 14016FEB          LDAH    I75+1
            1033 00494   1172  2 840000CA          AND     FF           MASK OFF +DVY
            1034 00496   1174  2 0C68              SRC     8
GENERATED                            0700
            1035 00498   1176  2 C4000014          LOR     TEMP         INSERT IT
            1036 0049A   1178  2 3C0100B9          STAH    051+1        STORE IT IN 051 DATA
            1037 0049C   1180  2 14016FED          LDAH    I76+1
            1038 0049E   1182  2 84000008          AND     00FF         MASK OFF -DVZ
            1039 004A0   1184  2 0848              SLL     8
GENERATED                            0700
            1040 004A2   1186  2 3C010014          STAH    TEMP
            1041 004A4   1188  2 14016FEB          LDAH    I75+1
            1042 004A6   1190  2 84000008          AND     00FF         MASK OFF +DVZ
            1043 004A8   1192  2 C4000014          LOR     TEMP         INSERT IT
            1044 004AA   1194  2 3C0100BB          STAH    052+1
            1045 004AC   1196  2 14016FF5          LDAH    I13+1
            1046 004AE   1198  2 3C0100C9          STAH    05E+1        05E DATA = I13 DATA
            1047 004B0   1200  2 14000032          LDA     BTE3
            1048 004B2   1202  2 84020800          AND     2048*M       IS BTE4 BIT FOR SIDL-03=0
            1049 004B4   1204  2 6110              JN      0091
```

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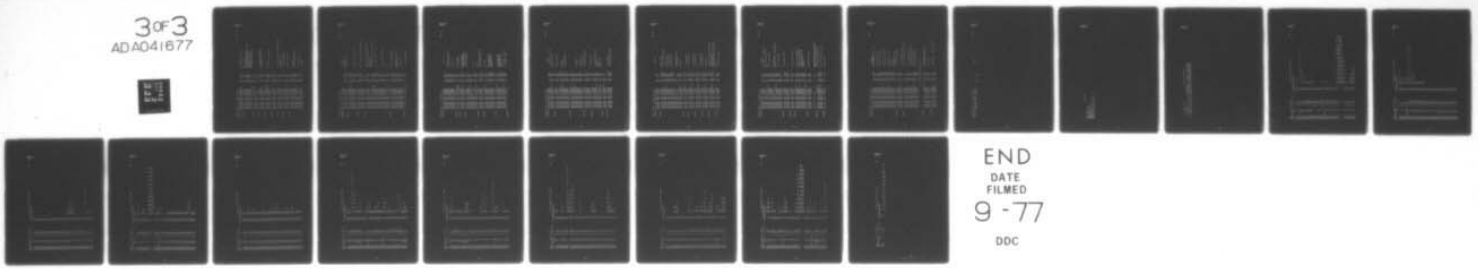
VERSION K20A0503      DECK NAME=*RTEXEC*                                                                PAGE  29

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
GENERATED                              0700
            1050 004B6   1206  2 14010030          LDAH   BTE1          YES
            1051 004B8   1208  2 8400000A          AND    0FFF          ISOLATE BITS F000 OF BTE1
            1052 004BA   1210  2 3C010030          STAH   BTE1
            1053 004BC   1212  2 140100C7          LDAH   05D+1
            1054 004BE   1214  2 840000C8          AND    F             ISOLATE FIELD F000
            1055 004C0   1216  2 C4000030          LOR    BTE1          INSERT IN BTE1 FIELD F000
            1056 004C2   1218  2 3C010030          STAH   BTE1
            1057 004C4   1220  2 14000032 D091     LDA    BTE3
            1058 004C6   1222  2 84020400          AND    1024*M        IS BTE4 BIT FOR SIDL-04=0
            1059 004C8   1224  2 6110              JN     D092
GENERATED                              0700
            1060 004CA   1226  2 14010030          LDAH   BTE1          YES
            1061 004CC   1228  2 840000CE          AND    F0UF          ISOLATE BITS F00F OF BTE1
            1062 004CE   1230  2 3C010030          STAH   BTE1
            1063 004D0   1232  2 140100C7          LDAH   05D+1
            1064 004D2   1234  2 84000006          AND    0FF0          ISOLATE FIELD 0FF0
            1065 004D4   1236  2 C4000030          LOR    BTE1          INSERT IN BTE1 FIELD 0FF0
            1066 004D6   1238  2 3C010030          STAH   BTE1
            1067 004D8   1240  2 14000032 D092     LDA    BTE3
            1068 004DA   1242  2 84020080          AND    128*M         IS BTE4 BIT FOR SIDL-07=0
            1069 004DC   1244  2 6110              JN     D093
GENERATED                              0700
            1070 004DE   1246  2 14010030          LDAH   BTE1          YES
            1071 004E0   1248  2 84000002          AND    FFFD          ISOLATE BITS FFFD OF BTE1
            1072 004E2   1250  2 3C010030          STAH   BTE1
            1073 004E4   1252  2 140100C7          LDAH   05D+1
            1074 004E6   1254  2 8400001C          AND    B15           ISOLATE FIELD 0002
            1075 004E8   1256  2 C4000030          LOR    BTE1          INSERT IN BTE1 FIELD 0002
            1076 004EA   1258  2 3C010030          STAH   BTE1
            1077 004EC   1260  2 14000032 D093     LDA    BTE3
            1078 004EE   1262  2 84020040          AND    64*M          IS BTE4 BIT FOR SIDL-08=0
            1079 004F0   1264  2 6110              JN     D094
GENERATED                              0700
            1080 004F2   1266  2 14010030          LDAH   BTE1          YES
            1081 004F4   1268  2 84000004          AND    FFFE          ISOLATE BTE1 FIELD FFFE
            1082 004F6   1270  2 3C010030          STAH   BTE1
            1083 004F8   1272  2 140100C7          LDAH   05D+1
            1084 004FA   1274  2 8400001E          AND    B16           ISOLATE FIELD 0001
            1085 004FC   1276  2 C4000030          LOR    BTE1
            1086 004FE   1278  2 3C010030          STAH   BTE1
            1087 00500   1280  2 14010030 D094     LDAH   BTE1
            1088 00502   1282  2 CC0000CC          EXO    FFFF          BTE1 = .NOT. BTE1
            1089 00504   1284  2 840000C2          AND    THTY          ((.NOT. BTE1).AND. 30 HEX)
            1090 00506   1286  2 3C010014          STAH   TEMP
            1091 00508   1288  2 140100AD          LDAH   014+1
            1092 0050A   1290  2 84000000          AND    FF0F          (014 DATA.AND.FF0F)
            1093 0050C   1292  2 C4000014          LOR    TEMP          (014 DATA.AND.FF0F).OR.TEMP
            1094 0050E   1294  2 3C0100AD          STAH   014+1
            1095 00510   1296  2 14000032          LDA    BTE3
            1096 00512   1298  2 84020010          AND    16*M          IS BTE4 BIT FOR SIDL-10=0
            1097 00514   1300  2 6106              JN     D095
GENERATED                              0700
            1098 00516   1302  2 140100C9          LDAH   05E+1
            1099 00518   1304  2 3C010031          STAH   BTE1+1        BTE2 = 05E DATA
```

AD-A041 677 AIR FORCE AVIONICS LAB WRIGHT-PATTERSON AFB OHIO F/G 17/7
CONVERSION OF COMPUTER SOFTWARE FOR THE GIMBALLED ELECTROSTATIC--ETC(U)
FEB 77 W MIKULSKI, W E SHEPHARD

UNCLASSIFIED AFAL-TR-77-8-VOL-2 NL

3 OF 3
AD A041677



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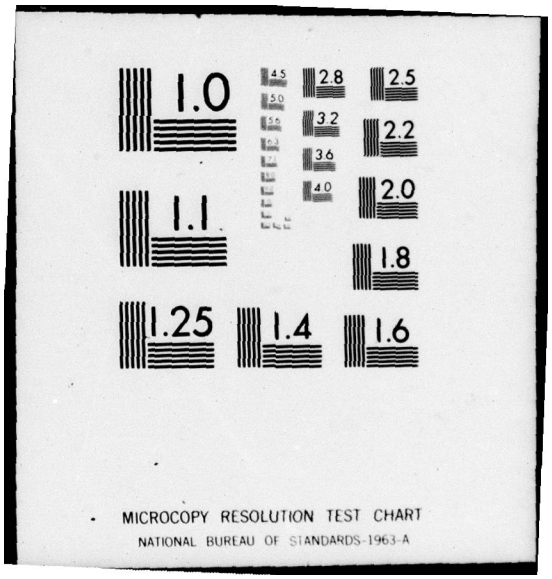
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2.8
3.2
3.6
4.0
4.5
5.0
5.6
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                SOURCE
            1100 0051A   1306  2 14000032 D095      LDA    BTE3
            1101 0051C   1308  2 84020080           AND    128.M        IS BTE4 BIT FOR SIDL-07=1
            1102 0051E   1310  2 611E               JN     D100         YES
GENERATED                          0700
            1103 00520   1312  2 140100B5           LDAH   04E+1        LOAD 04E DATA
            1104 00522   1314  2 8C000000           SAM    B1,L         CHECK SIGN OF R.A.T. FIELD
            1105 00524   1316  2 6430052C           JGU    D096         R.A.T. FIELD POSITIVE - GO TO D096
            1106 00526   1318  2 840000BA           AND    RATMS3       MASK OFF MAGNITUDE BITS
            1107 00528   1320  2 CC000008           EXO    NONE         COMPLEMENT
            1108 0052A   1322  2 A400000A           ADU    ONE          ADD 1 FOR 2'S COMPLEMENT
            1109 0052C   1324  2 0C59      D096     SRA    25           SHIFT POSITIVE R.A.T. FIELD
GENERATED                          0700
            1110 0052E   1326  2 5400001C D097      LDB    ZERO
            1111 00530   1328  2 0480               CXF
            1112 00531   1329  2      6102         JN     *+2
            1113 00532   1330  2 6004               JU     D098
GENERATED                          0700
            1114 00534   1332  2 E40000AA           SBU    C10S23       SCALE R.A.T. FOR SUMMATION
            1115 00536   1334  2 3C00003A D098      STA    RAT          STORE 04E RAT FIELD IN RAT
            1116 00538   1336  2 140100B3           LDAH   04D+1        (A)= 04D DATA
            1117 0053A   1338  2 6004               JU     D150
GENERATED                          0700
            1118 0053C   1340  2 1400001C D100      LDA    ZERO
            1119 0053E   1342  2 3C010039 D150      STAH   ROTR+1       ROTR=(A)
            1120 00540   1344  2 14000032           LDA    BTE3
            1121 00542   1346  2 84020100           AND    256.M        IS BTE4 BIT FOR SIDL-08=0
            1122 00544   1348  2 6122               JN     D155
GENERATED                          0700
            1123 00546   1350  2 14000036           LDA    BARO
            1124 00548   1352  2 3C000014           STA    TEMP
            1125 0054A   1354  2 140100CB           LDAH   025+1
            1126 0054C   1356  2 0876               SRLD   22
GENERATED                          0700
            1127 0054E   1358  2 3C000036           STA    BARO         BARO = BAROMETRIC ALTITUDE FIELD OF 025
            1128 00550   1360  2 14000014           LDA    TEMP
            1129 00552   1362  2 E4000036           SBU    BARO         TEMP-BARO
            1130 00554   1364  2 6208               JG     D151         IS (TEMP-BARO).GT.0
GENERATED                          0700
            1131 00556   1366  2 3C000014           STA    TEMP         NO; TAKE ABS(TEMP-BARO)
            1132 00558   1368  2 1400001C           LDA    ZERO
            1133 0055A   1370  2 E4000014           SBU    TEMP
            1134 0055C   1372  2 E4020008 D151      SBU    8.M          IS ABS(TEMP-BARO).GT.8
            1135 0055E   1374  2 6308               JL     D155         NO
GENERATED                          0700
            1136 00560   1376  2 14010032           LDAH   BTE3
            1137 00562   1378  2 C4000018           LOR    B13
            1138 00564   1380  2 3C010032           STAH   BTE3         BTE3=BTE3.OR.B13
            1139 00566   1382  2 64040000 D155      JS     CDPU         PROCESS DOPPLER DISCRETES
            1140 00568   1384  2 14000136           LDA    CD63+2
            1141 0056A   1386  2 54000134           LDB    CD63
            1142 0056C   1388  2 0400               CFX
            1143 0056D   1389  2      6100         JN     D157         IS ALTITUDE FLAG = 0
            1144 0056E   1390  2 14000036           LDA    BARO
            1145 00570   1392  2 5400001C           LDB    ZERO
            1146 00572   1394  2 0480               CXF                 FLOAT BARO
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VERSION K20A0503     DECK NAME=*RTEXEC*                                                                  PAGE  31

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                 SOURCE
GENERATED                              0700
           1147 00574  1396  2 9C000130          AFD    CD62         BARO+CD62
           1148 00576  1398  2 9400012E          MLF    CD61+2       CD61*(BARO+CD62)
           1149 00578  1400  2 6006              JU     D158
GENERATED                              0700
           1150 0057A  1402  2 1400013A D157     LDA    CD64+2
           1151 0057C  1404  2 54000138          LDB    CD64
           1152 0057E  1406  2 3C000012 D158     STA    ALT+2
           1153 00580  1408  2 7C000010          STB    ALT
           1154 00582  1410  2 14000032          LDA    BTE3
           1155 00584  1412  2 84020080          AND    128,M        IS BTE4 BIT FOR SIDL-09=1
           1156 00586  1414  2 6118              JN     D160         YES
GENERATED                              0700
           1157 00588  1416  2 140000CC          LDA     060
           1158 0058A  1418  2 840000C4          AND    HEDMSK
           1159 0058C  1420  2 3C000050          STA    HDGV         HDGV = HEADING VELOCITY FIELD FROM 060
           1160 0058E  1422  2 140100CD          LDAH   060+1
           1161 00590  1424  2 840000CA          AND    FF
           1162 00592  1426  2 0C58              SRA    24
GENERATED                              0700
           1163 00594  1428  2 3C00004E          STA    DRFV         DRFV = DRIFT VELOCITY FIELD FROM 060
           1164 00596  1430  2 14010085          LDAH   04E+1
           1165 00598  1432  2 84000088          AND    RATMS2       MASK OFF VERTICAL VELOCITY
           1166 0059A  1434  2 0847              SLL    7            PICK UP SIGN
           1167 0059B  1435  2     0C57          SRA    23           RIGHT JUSTIFY
           1168 0059C  1436  2 3C00004C          STA    VRTV         VRTV = VERTICAL VELOCITY FIELD OF 04E
           1169 0059E  1438  2 5C2A0004 D160     LDX    5,4,M
           1170 005A0  1440  2 16800020 D161     LDA    DPVV,5
           1171 005A2  1442  2 A680004C          ADD    VRTV,5       DPVV(I)=DPVV(I)+VRTV(I)   I=1,3
           1172 005A4  1444  2 3E800020          STA    DPVV,5
           1173 005A6  1446  2 6C2B0002          IMN    5,2,M
           1174 005A8  1448  2 643005A0          JGU    D161
           1175 005AA  1450  2 5400001C          LDB    ZERO
           1176 005AC  1452  2 14000030          LDA    BTE1
           1177 005AE  1454  2 8C00001C          SAM    B15          IS BTE1 BIT FOR RAT BITE = 1
           1178 005B0  1456  2 643005B4          JGU    D163
           1179 005B2  1458  2 7C00003A          STB    RAT          RAT=0
           1180 005B4  1460  2 1400003A D163     LDA    RAT
           1181 005B6  1462  2 6102              JN     D164
           1182 005B7  1463  2     602F          JU     D165         YES
           1183 005B8  1464  2 6318     D164     JL     D164A
GENERATED                              0700
           1184 005BA  1466  2 9C00000C          AFD    RATP         RAT.GT.0; RATP=RATP+RAT
           1185 005BC  1468  2 3C00000E          STA    RATP+2
           1186 005BE  1470  2 7C00000C          STB    RATP
           1187 005C0  1472  2 140000AC          LDA    014
           1188 005C2  1474  2 840000DC          AND    FF3F         CLEAR RAT+ AND RAT- BITS
           1189 005C4  1476  2 C4020040          LOR    64,M         SET RAT+ BIT TO 1
           1190 005C6  1478  2 3C0000AC          STA    014
           1191 005C8  1480  2 1400003C          LDA    RATL
           1192 005CA  1482  2 A400000A          ADD    ONE          RATL=RATL+1
           1193 005CC  1484  2 3C00003C          STA    RATL
           1194 005CE  1486  2 601A              JU     D166
GENERATED                              0700
           1195 005D0  1488  2 9C000008 D164A    AFD    RATM         RAT.LT.0; RATM=RATM+RAT
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            1196 0050Z   1490  2 3C00000A          STA    RATM+2
            1197 00504   1492  2 7C000008          STB    RATM
            1198 0050Ø   1494  2 140000AC          LDA    014
            1199 00508   1496  2 840000DC          AND    FF3F        CLEAR RAT+ AND RAT- BITS
            1200 0050A   1498  2 C4020080          LOR    128,M       SET RAT- BIT TO 1
            1201 0050C   1500  2 3C0000AC          STA    014
            1202 0050E   1502  2 1400003C          LDA    RATL
            1203 005E0   1504  2 E400000A          SBU    ONE         RATL=RATL-1
            1204 005E2   1506  2 3C00003C          STA    RATL
            1205 005E4   1508  2 6004              JU     D166
GENERATED                       0700
            1206 005E6   1510  2 3C00003C D165     STA    RATL        RAT=0 SO RATL=0
            1207 005E8   1512  2 6206     D166     JG     D167        IS RATL .GE.0
GENERATED                       0700
            1208 005EA   1514  2 1400001C          LDA    ZERO
            1209 005EC   1516  2 E400003C          SBU    RATL        NO; TAKE ABS(RATL)
            1210 005EE   1518  2 E4020800 D167     SBU    2048,M      (ABS(RATL)-32*64)
            1211 005F0   1520  2 6308              JL     D170        IS ABS(RATL).GE.32*64)
GENERATED                       0700
            1212 005F2   1522  2 14000032          LDA    BTE3        YES; BTE3=BTE3.OR.B5
            1213 005F4   1524  2 C4000008          LOR    B5
            1214 005F6   1526  2 3C000032          STA    BTE3
            1215 005F8   1528  2 14000038 D170     LDA    ROTR
            1216 005FA   1530  2 086E              SRLD   14
            1217 005FC   1531  2      06A8         LXA    5
            1218 005FC   1532  2 6102              JN     D171        IS I=0
            1219 005FD   1533  2      6057         JU     D240
            1220 005FE   1534  2 E400000E D171     SBU    THREE
            1221 00600   1536  2 610A              JN     D180        IS I=3
GENERATED                       0700
            1222 00602   1538  2 14010032          LDAM   BTE3        NO; SET BITS IN BITE WORD
            1223 00604   1540  2 C40000C6          LOR    0006        BTE3 BITS 0006 = 3
            1224 00606   1542  2 3C010032          STAM   BTE3
            1225 00608   1544  2 604C              JU     D240
GENERATED                       0700
            1226 0060A   1546  2 24280002 D180     ICL    5,2,M       IS IT ROT1
            1227 0060C   1548  2 6430061C          JGU    D181        NO
            1228 0060E   1550  2 14000010          LDA    ROT1
            1229 00610   1552  2 3C000014          STA    TEMP        SAVE PREVIOUS ROT1
            1230 00612   1554  2 14000038          LDA    ROTR        LOAD ROTOR SPEED
            1231 00614   1556  2 84023FFF          AND    16383,M     MASK OFF BITS 3FFF
            1232 00616   1558  2 3C000010          STA    ROT1        UPDATE ROT1
            1233 00618   1560  2 3C000016          STA    TEMP2
            1234 0061A   1562  2 600E              JU     D182
GENERATED                       0700
            1235 0061C   1564  2 14000012 D181     LDA    ROT2
            1236 0061E   1566  2 3C000014          STA    TEMP        SAVE PREVIOUS ROT2
            1237 00620   1568  2 14000038          LDA    ROTR        LOAD ROTOR SPEED
            1238 00622   1570  2 84023FFF          AND    16383,M     MASK OFF BITS 3FFF
            1239 00624   1572  2 3C000012          STA    ROT2        UPDATE ROT2
            1240 00626   1574  2 3C000016          STA    TEMP2
            1241 00628   1576  2 E4000014 D182     SBU    TEMP        (TEMP-ROT(I))  I=1 OR 2
            1242 0062A   1578  2 E4020020          SBU    32,M
            1243 0062C   1580  2 6206              JG     D183        IS (TEMP-ROT(I))<32)
GENERATED                       0700
```

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            1244 0062E   1582  2 14000016        LDA   TEMP2
            1245 00630   1584  2 3C000014        STA   TEMP       YES; TEMP=ROT(I)  I=1 OR 2
            1246 00632   1586  2 14000002 D183   LDA   RMIN
            1247 00634   1588  2 E4000014        SBU   TEMP       IS RMIN .GE. TEMP
            1248 00636   1590  2 6208            JG    D184       YES
GENERATED                          0700
            1249 00638   1592  2 14000014        LDA   TEMP
            1250 0063A   1594  2 E4000000        SBU   RMAX       IS TEMP .GE. RMAX
            1251 0063C   1596  2 6202            JG    D184
            1252 0063D   1597  2     6005        JU    D185
            1253 0063E   1598  2 14024000 D184   LDA   16384.M
            1254 00640   1600  2 3C000014        STA   TEMP       TEMP=B2
            1255 00642   1602  2 24280002 D185   ICL   5,2,M      IS IT ROT1
            1256 00644   1604  2 6430064E        JGU   D186
            1257 00646   1606  2 14000014        LDA   TEMP       YES; R1CT=TEMP-ROT1
            1258 00648   1608  2 E4000010        SBU   ROT1
            1259 0064A   1610  2 3C000034        STA   R1CT
            1260 0064C   1612  2 6008            JU    D240
GENERATED                          0700
            1261 0064E   1614  2 14000014 D186   LDA   TEMP
            1262 00650   1616  2 E4000012        SBU   ROT2
            1263 00652   1618  2 3C000036        STA   R2CT
            1264 00654   1620  2 14000034 D240   LDA   R1CT
            1265 00656   1622  2 A400000A        ADU   ONE
            1266 00658   1624  2 3C000034        STA   R1CT       R1CT=R1CT+1
            1267 0065A   1626  2 14000036        LDA   R2CT
            1268 0065C   1628  2 A400000A        ADU   ONE
            1269 0065E   1630  2 3C000036        STA   R2CT       R2CT=R2CT+1
            1270 00660   1632  2 E4020018        SBU   24.M
            1271 00662   1634  2 6314            JL    D245       IS (R2CT .GE. 24)
GENERATED                          0700
            1272 00664   1636  2 14000032        LDA   BTE3       YES; BTE3=BTE3 .OR. B15
            1273 00666   1638  2 C400001C        LOR   B15
            1274 00668   1640  2 3C000032        STA   BTE3
            1275 0066A   1642  2 14000034        LDA   R1CT
            1276 0066C   1644  2 E4020018        SBU   24.M
            1277 0066E   1646  2 6308            JL    D245       IS (R1CT .GE. 24)
GENERATED                          0700
            1278 00670   1648  2 14000032        LDA   BTE3
            1279 00672   1650  2 C400001A        LOR   B14
            1280 00674   1652  2 3C000032        STA   BTE3       YES; BTE3=BTE3 .OR. B14
            1281 00676   1654  2 14000060 D245   LDA   ITER
            1282 00678   1656  2 6102            JN    D246       IS ITER = 0
            1283 00679   1657  2     6005        JU    D247       YES
            1284 0067A   1658  2 E4020010 D246   SBU   16.M       IS ITER = 16
            1285 0067C   1660  2 611E            JN    D250       YES
GENERATED                          0700
            1286 0067E   1662  2 14000010 D247   LDA   ROT1
            1287 00680   1664  2 5400001C        LDB   ZERO
            1288 00682   1666  2 0480            CXF
GENERATED                          0700
            1289 00684   1668  2 94000022        MLF   ONHLF+2     ROT1*0.5 SECOND
            1290 00686   1670  2 9C000000        AFD   SRT1
            1291 00688   1672  2 3C000002        STA   SRT1+2     SRT1=SRT1+ROT1*0.5 SECOND
            1292 0068A   1674  2 7C000000        STB   SRT1
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            1293 0068C   1676  2 14000012          LDA    ROT2
            1294 0068E   1678  2 5400001C          LDB    ZERO
            1295 00690   1680  2 0480              CXF
GENERATED                          0700
            1296 00692   1682  2 94000022          MLF    ONMLF+2      ROT2*0.5 SECOND
            1297 00694   1684  2 9C000004          AFD    SRT2
            1298 00696   1686  2 3C000006          STA    SRT2+2       SRT2=SRT2+ROT2*0.5 SECOND
            1299 00698   1688  2 7C000004          STB    SRT2
            1300 0069A   1690  2 14016FF9 D250     LDAM   I24+1
            1301 0069C   1692  2 3C01008F          STAM   06C+1        06C DATA=I24 DATA
            1302 0069E   1694  2 14016FF8          LDAM   I28+1
            1303 006A0   1696  2 3C010091          STAM   06D+1        06D DATA=I28 DATA
            1304 006A2   1698  2 14016FFD          LDAM   I2C+1
            1305 006A4   1700  2 3C010093          STAM   06E+1        06E DATA=I2C DATA
            1306 006A6   1702  2 14000136          LDA    C063+2
            1307 006A8   1704  2 54000134          LDB    C063
            1308 006AA   1706  2 0400              CFX
            1309 006AB   1707  2      0500        EAB                 PUT AHRS FLAG IN A REG
            1310 006AC   1708  2 6102              JN     D251         IS AHRS FLAG=0
            1311 006AD   1709  2      6007        JU     D252
            1312 006AE   1710  2 14000110 D251    LDA    HEDL
            1313 006B0   1712  2 3C000022          STA    LHED         LHED=HEDL
            1314 006B2   1714  2 6020              JU     D254
GENERATED                          0700
            1315 006B4   1716  2 14010033 D252    LDAM   BTE3+1
            1316 006B6   1718  2 8400001A          AND    B14
            1317 006B8   1720  2 6106              JN     D252A        IS BTE4.AND.B14=0
GENERATED                          0700
            1318 006BA   1722  2 1401008F          LDAM   06C+1        YES; LHED=06C DATA
            1319 006BC   1724  2 3C010023          STAM   LHED+1
            1320 006BE   1726  2 14010033 D252A    LDAM   BTE3+1
            1321 006C0   1728  2 8400001C          AND    B15
            1322 006C2   1730  2 6106              JN     D252B        IS BTE4.AND.B15=0
GENERATED                          0700
            1323 006C4   1732  2 14010091          LDAM   06D+1        YES; LPCH=06D DATA
            1324 006C6   1734  2 3C010025          STAM   LPCH+1
            1325 006C8   1736  2 14010033 D252B    LDAM   BTE3+1
            1326 006CA   1738  2 8400001E          AND    B16
            1327 006CC   1740  2 6106              JN     D254         IS BTE4.AND.B16=0
GENERATED                          0700
            1328 006CE   1742  2 14010093          LDAM   06E+1        YES; LROL=06E DATA
            1329 006D0   1744  2 3C010027          STAM   LROL+1
            1330 006D2   1746  2 14000032 D254    LDA    BTE3
            1331 006D4   1748  2 84020300          AND    768,M        BTE4.AND.768
            1332 006D6   1750  2 6152              JN     D280
GENERATED                          0700
            1333 006D8   1752  2 5C220000          LDX    4,0,M        INITIALIZE XR4 AND XR5 FOR DO LOOP
            1334 006DA   1754  2 5C2A0000          LDX    5,0,M
            1335 006DC   1756  2 1400001C D254A    LDA    ZERO         CLEAR A REGISTER
            1336 006DE   1758  2 56810087          LDBM   050+1,5      LOAD B REG WITH 05(I) DATA  I=0,2
            1337 006E0   1760  2 0808              SLLD   8            PUT MDV(I) IN A REG.  I= X OR Y OR Z
GENERATED                          0700
            1338 006E2   1762  2 3C000014          STA    TEMP         SAVE IT
            1339 006E4   1764  2 16800086          LDA    050,5
            1340 006E6   1766  2 840200FF          AND    255,M        MASK OFF POSITIVE SUM
```

DIAGNOSTICS	LINE	ADRES	DADRES	LC	PROGRAM				SOURCE
	1341	006E8	1768	2	3C000016		STA	TEMP2	
	1342	006EA	1770	2	A4000014		ADU	TEMP	PDV(I)+MDV(I) I=X OR Y OR Z
	1343	006EC	1772	2	E4020100		SBU	256,M	
	1344	006EE	1774	2	6102		JN	D255	DOES (PDV(I)+MDV(I))=256
	1345	006EF	1775	2	600D		JU	D260	NO
	1346	006F0	1776	2	14000032	D255	LDA	BTE3	
	1347	006F2	1778	2	C680000C		LOR	B7,5	DELTA V SUM BAD BIT=1
	1348	006F4	1780	2	3C000032		STA	BTE3	
	1349	006F6	1782	2	14000014		LDA	TEMP	
	1350	006F8	1784	2	A4000016		ADU	TEMP2	
	1351	006FA	1786	2	6124		JN	D271	DOES MDV+PDV=0
	1352	006FA	1787	2	601D		JU	D270	NO; GO SET DELTA V UNREASONABLE BIT
	1353	006FC	1788	2	14020100	D260	LDA	256,M	YES
	1354	006FE	1790	2	E4000014		SBU	TEMP	
	1355	00700	1792	2	E4000014		SBU	TEMP	DVX(I)= 256-MDV-MDV
	1356	00702	1794	2	3C000018		STA	TEMP4	
	1357	00704	1796	2	5400001C		LDB	ZERO	
	1358	00706	1798	2	0480		CXF		
GENERATED					0700				
	1359	00708	1800	2	3E00003C		STA	TDVX+2,4	STORE FLOATED DELTA V'S
	1360	0070A	1802	2	7E00003A		STB	TDVX,4	
	1361	0070C	1804	2	14000018		LDA	TEMP4	
	1362	0070E	1806	2	8402FF7F		AND	MSK,M	
	1363	00710	1808	2	6204		JG	*+4	
GENERATED					0700				
	1364	00712	1810	2	CC02FF7F		EXO	MSK,M	
	1365	00714	1812	2	E4020040		SBU	64,M	IS DVX .GT.64 OR .LT.-63
	1366	00716	1814	2	6308		JL	D271	
GENERATED					0700				
	1367	00718	1816	2	14000032	D270	LDA	BTE3	
	1368	0071A	1818	2	C6800012		LOR	B10,5	SET DELTA V UNREASONABLE BIT
	1369	0071C	1820	2	3C000032		STA	BTE3	
	1370	0071E	1822	2	6C220004	D271	IMP	4,4,M	INCREMENT INDEX REGISTERS
	1371	00720	1824	2	6C2A0002		IMP	5,2,M	
	1372	00722	1826	2	242B0006		ICL	5,6,M	TEST XRS FOR END OF LOOP
	1373	00724	1828	2	64300728		JGU	D280	JUMP OUT OF LOOP
	1374	00726	1830	2	643006DC		JGU	D254A	LOOP BACK
	1375	00728	1832	2	64040000	D280	JS	VECADD	
	1376	0072A	1834	2	6008		JU	*+8	
GENERATED					0700				
	1377	0072C	1836	2	00000014		PTR	DVXG	DVXG(I)=DVXG(I)+DVX(I)
	1378	0072E	1838	2	0000003A		PTR	TDVX	
	1379	00730	1840	2	00000014		PTR	DVXG	
					*				
					*				
	1380	00732	1842	2	605A		JU	D300	BYPASS RESOLVER CHECK. THIS CODE IS UNUSED AT THIS TIME(11 JUL 75)
					*				
GENERATED					0700				
	1381	00734	1844	2	5C2A0000	D290	LDX	5,0,M	INITIALIZE INDICIES FOR LOOP
	1382	00736	1846	2	5C220000		LDX	4,0,M	
	1383	00738	1848	2	16816FE3	D290A	LDAH	I71+1,5	
	1384	0073A	1850	2	3E8100BD		STAH	O53+1,5	O53(I) DATA=I71(I) DATA I=1,4
	1385	0073C	1852	2	0480		CXF		
GENERATED					0700				
	1386	0073E	1854	2	E40000A8		SBU	C30S23	SCALE TO 2**-14

VERSION K20A0503 DECK NAME=*MTEXEC*

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
            1387 00740  1856  2 9E0000F0          AFD    CD46,4      RESIN(I)+RBIAS(I)
            1388 00742  1858  2 8C0000AE          ADF    F304        RESIN(I)+RBIAS(I)+0.75  I=1,4
            1389 00744  1860  2 3C000014          STA    TEMP
            1390 00746  1862  2 14000030          LDA    BTE1
            1391 00748  1864  2 8C000006          SAM    B4          IS R/D BIT OF BTE1+1
            1392 0074A  1866  2 64300750          JGU    D291
            1393 0074C  1868  2 16800014          LDA    RES1,5      YES; TEMP=RES(I)  I=1,4
            1394 0074E  1870  2 3C000014          STA    TEMP
            1395 00750  1872  2 14010033 D291     LDAH   BTE3+1
            1396 00752  1874  2 8E800004          SAM    B3,5        IS SIDL(I) BIT OF BTE4=1
            1397 00754  1876  2 6430075A          JGU    D292
            1398 00756  1878  2 16800014          LDA    RES1,5      YES; TEMP=RES(I)  I=1,4
            1399 00758  1880  2 3C000014          STA    TEMP
            1400 0075A  1882  2 16800014 D292     LDA    RES1,5
            1401 0075C  1884  2 3C000016          STA    TEMP2       TEMP2=RES(I)   I=1,4
            1402 0075E  1886  2 14000014          LDA    TEMP
            1403 00760  1888  2 3E800014          STA    RES1,5      RES(I)=TEMP
            1404 00762  1890  2 14000016          LDA    TEMP2
            1405 00764  1892  2 FE800014          SBF    RES1,5      TEMP2-RES(I)
            1406 00766  1894  2 6208              JG     D293        IS (TEMP2-RES(I)).GE.0
GENERATED                       0700
            1407 00768  1896  2 3C000018          STA    TEMP4       NO; TAKE ABS(TEMP2-RES(I))
            1408 0076A  1898  2 1400001C          LDA    ZERO
            1409 0076C  1900  2 FC000018          SBF    TEMP4
            1410 0076E  1902  2 FC00001E D293     SBF    FONE
            1411 00770  1904  2 6308              JL     D294        IS ABS(TEMP2-RES(I)).GE.1.0
GENERATED                       0700
            1412 00772  1906  2 14000032          LDA    BTE3        YES; ANY GIMBAL RATE BIT OF BTE3=1
            1413 00774  1908  2 C4000000          LOR    B1
            1414 00776  1910  2 3C000032          STA    BTE3
            1415 00778  1912  2 14000032 D294     LDA    BTE3
            1416 0077A  1914  2 8C000000          SAM    B1          IS ANY GIMBAL RATE BIT=1
            1417 0077C  1916  2 64300782          JGU    D295
            1418 0077E  1918  2 C400001E          LOR    B16         YES; GIMBAL SPIN BIT OF BTE3=1
            1419 00780  1920  2 3C000032          STA    BTE3
            1420 00782  1922  2 6C2A0002 D295     IMP    5,2,M       INCREMENT FOR NEXT PASS
            1421 00784  1924  2 6C220004          IMP    4,4,M
            1422 00786  1926  2 642A000B          ICN    5,5,M       CHECK FOR END OF LOOP
            1423 00788  1928  2 6430078C          JGU    D300
            1424 0078A  1930  2 60D2              JU     D290A
                                *
                                *     END OF BYPASSED RESOLVER CHECK CODE
                                *
GENERATED                       0700
            1425 0078C  1932  2 14010031 D300     LDAH   BTE1+1      LOAD A REG. WITH BTE2
            1426 0078E  1934  2 8C000008          SAM    B5          IS INPUT POWER BIT OF BTE2=1
            1427 00790  1936  2 64300798          JGU    D301
            1428 00792  1938  2 1400001C          LDA    ZERO
            1429 00794  1940  2 3C000038          STA    CIPM        YES; CIPM=0
            1430 00796  1942  2 6008              JU     D310
GENERATED                       0700
            1431 00798  1944  2 14000038 D301     LDA    CIPM
            1432 0079A  1946  2 A400000A          ADD    ONE         CIPM=CIPM+1/32    (ONE=SCLB  0.03125)
            1433 0079C  1948  2 3C000038          STA    CIPM
            1434 0079E  1950  2 64040000 D310     JS     TKTH
```

VERSION K20A0503 DECK NAME=*RTEXEC* PAGE 37

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                    SOURCE
            1435 007A0   1952  2 74000004        RTA    DECOR
            1436                                  END
```

STATISTICS

TOTAL SHORTS 181
TOTAL LONGS 754
TOTAL INSTRUCTIONS 935
PERCENT SHORT 19.4
GENERATED NOPS 120
THEORETICAL PERCENT NOP LOADING 9.0
ACTUAL PERCENT NOP LOADING 6.6

```
 DECK NAME=*HTEXEC*                    *****ERROR MESSAGES*****

 LINE NUMBER                DIAGNOSTIC
1   17.....ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
2   200.....ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
3   364.....ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
4   532.....ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
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XREF 1 DECK NAME=*RTEXEC* SKC 2000 CROSS REFERENCE DICTIONARY PAGE 1

RELATIVE ADDRESS (OR SET VALUE) — VARIABLE NAME — LINE NUMBERS OF OCCURRENCES (DEFINED, REFERENCES)

HEX	DEC	BIT	LC	VARIABLE NAME	DEFINED	REFERENCES
000F2	242		4	AJ	128	
00010	16		7	ALT	134	1152 1153
0001C	28		11	ANGL	187	
00150	336		7	AP	163	
07FC0	32704			APOIC	2	641 645 647 649 656 750 752 754 756
0015C	348		7	AT	164	
00036	54		1	BARO	338	1123 1127 1129 1144
00022	34		1	BCTR	328	
00000	0		1	BDSIM	311	776 818
002B0	688		2	BDSI1	779	781
002B8	696		2	BDSI2	783	786
002C4	708		2	BDSI4	789	791
002CC	716		2	BDSI5	793	795
002F6	758		2	BDSI6	814	817
002AA	682		2	BDSI	776	503 774
00000	0		11	BDS1	173	764
00002	2		11	BDS2	174	
00004	4		11	BDS3	175	
00006	6		11	BDS4	176	
0002A	42		1	BER1	332	
0002C	44		1	BER2	333	
0002E	46		1	BER3	334	
00030	48		1	BER4	335	
00000	0		12	BITCOM	292	
0000E	14		2	BITEJM	367	809
*****UNDEFINED*****				BITE		367
00006	6		2	BIT16	363	
00018	24		1	BLP1	323	779
0001A	26		1	BLP2	324	
0001C	28		1	BLP3	325	
0001E	30		1	BLP4	326	
00008	8		11	BMK1	177	
0000A	10		11	BMK2	178	
0000C	12		11	BMK3	179	
0000E	14		11	BMK4	180	
00020	32		1	BNBR	327	
000C0	192		2	BTEMSK	456	1011
00030	48		4	BTE1	35	1050 1052 1055 1056 1060 1062 1065 1066 1070 1072 1075 1076 1080 1082 1085 1086 1087 1099 1176 1390 1425
00032	50		4	BTE3	36	825 852 854 859 861 863 865 874 876 892 894 928 1047 1057 1067 1077 1095 1100 1120 1136 1138 1154 1212 1214 1222 1224 1272 1274 1278 1280 1315 1320 1325 1330 1346 1348 1367 1369 1395 1412 1414 1415 1419
00016	22		2	BTIN	371	783
00000	0		12	B1	293	620 728 893 1104 1413 1416
00012	18		12	B10	302	1368
00014	20		12	B11	303	
00016	22		12	B12	304	
00018	24		12	B13	305	929 1137
0001A	26		12	B14	306	1279 1316
0001C	28		12	B15	307	1074 1177 1273 1321
0001E	30		12	B16	308	1084 1326 1418
00002	2		12	B2	294	626 651 689 694 717

XREF 1 DECK NAME=*RTEXEC* SKC 2000 CROSS REFERENCE DICTIONARY PAGE 2

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES
00004	4	12	B3		295	631 734 853 1396
00006	6	12	B4		296	1391
00008	8	12	B5		297	1213 1426
0000A	10	12	B6		298	
0000C	12	12	B7		299	1006 1347
0000E	14	12	B8		300	
00010	16	12	B9		301	603 992
*****UNDEFINED*****				CDPU		1139
00104	260	2		CDU	548	365 546
00002	2	1		CDUIR	312	537 543 548 559 563 571 577 584 588 591
000F6	246	2		CDUI	537	504 535
0000A	10	2		CDUJMP	365	541
00006	6	1		CDUS1	314	539 549 569
00008	8	1		CDUS2	315	540 552 558
0011A	282	2		CDU10	559	556
0011C	284	2		CDU20	560	553
00124	292	2		CDU21	564	562
0012C	300	2		CDU30	568	551
00132	306	2		CDU31	571	567
00134	308	2		CDU40	572	550
00140	320	2		CDU41	578	572
0014A	330	2		CDU42	585	578
00152	338	2		CDU43	589	585
0003C	60	9		CD01	225	
00040	64	9		CD02	226	
00044	68	9		CD03	227	
00048	72	9		CD04	228	
0004C	76	9		CD05	229	
00050	80	9		CD06	230	
00054	84	9		CD07	231	
00058	88	9		CD08	232	
0005C	92	9		CD09	233	
00060	96	9		CD10	234	
00064	100	9		CD11	235	
00068	104	9		CD12	236	
0006C	108	9		CD13	237	
00070	112	9		CD14	238	
00074	116	9		CD15	240	
00078	120	9		CD16	241	
0007C	124	9		CD17	242	
00080	128	9		CD18	243	
00084	132	9		CD19	244	
00088	136	9		CD20	245	
0008C	140	9		CD21	246	
00090	144	9		CD22	247	
00094	148	9		CD23	248	
00098	152	9		CD24	249	
0009C	156	9		CD25	250	
000A0	160	9		CD26	251	
000A4	164	9		CD27	252	
000A8	168	9		CD28	253	
000AC	172	9		CD29	254	
000B0	176	9		CD30	255	

XREF 1 DECK NAME=$RTEXEC$ SRC 2000 CROSS REFERENCE DICTIONARY PAGE 3

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES						
000B4	180	9		CD31	256							
000B8	184	9		CD32	257							
000BC	188	9		CD33	258							
000C0	192	9		CD34	259							
000C4	196	9		CD35	260							
000C8	200	9		CD36	261							
000CC	204	9		CD37	262							
000D0	208	9		CD38	263							
000D4	212	9		CD39	264							
000D8	216	9		CD40	266							
000DC	220	9		CD41	267							
000E0	224	9		CD42	268							
000E4	228	9		CD43	269							
000E8	232	9		CD44	270							
000EC	236	9		CD45	271							
000F0	240	9		CD46	272	1387						
000F4	244	9		CD47	273							
000F8	248	9		CD48	274							
000FC	252	9		CD49	275							
00100	256	9		CD50	276							
00104	260	9		CD51	277							
00108	264	9		CD52	278							
0010C	268	9		CD53	279							
00110	272	9		CD54	281							
00114	276	9		CD55	282							
00118	280	9		CD56	283							
0011C	284	9		CD57	284							
00120	288	9		CD58	285							
00124	292	9		CD59	286							
00128	296	9		CD60	287							
0012C	300	9		CD61	288	1145						
00130	304	9		CD62	289	1147						
00134	308	9		CD63	290	1140	1141	1306	1307			
00138	312	9		CD64	291	1150	1151					
0000C	12	7		CGOL	133	171						
00038	56	4		CIPM	39	1429	1431	1433				
0000C	12	7		CL	171							
00028	40	11		CMD1	192							
0002C	44	11		CMD2	193							
00030	48	11		CMD3	194							
00034	52	11		CMD4	195							
00000	0	9		CONCOM	197							
00052	82	4		CTR1	49	793						
00054	84	4		CTR2	50							
00056	86	4		CTR3	51							
00004	4	7		CWT	131							
0004A	74	4		CYLE	45	526	663	665	765	767	884	896
0002E	46	7		C1	141							
000AA	170	2		C10S23	445	1114						
00032	50	7		C2	142							
00036	54	7		C3	143							
000A8	168	2		C30S23	444	1386						
0003A	58	7		C4	144							

XREF 1 DECK NAME=*RTEXEC* SRC 2000 CROSS REFERENCE DICTIONARY PAGE 4

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
000E4	228	7		D	158	165											
00066	102	4		DATA	57	942											
00020	32	11		DATI	188	933	937	940									
00002	2	9		DCSR	200												
08600	46592			DEC	12	530											
00010	16	2		DECDUM	368	805											
00004	4	1		DECDX	313	823	1435										
00300	768	2		DECD	823	368	821										
00030	48	9		DELT	221												
0001C	28	9		DFONE	215												
00078	120	7		DG	153												
00014	20	1		DMAERR	321	605	607	636	685	687	698	700	724	726	730	732	736
						738	740	742	890	891							
0000A	10	1		DMASAV	316	594	595	596	602	604	610	611	612	657	659	673	675
						676	678	688	693	702	703	704	708	710	711	713	727
						757	759	768	769	770							
00024	36	4		DPDV	32												
00028	40	4		DPHV	33												
00020	32	4		DPVV	31	1170	1172										
0004E	78	4		DRFV	47	1163											
*****UNDEFINED*****				DUMY		366											
0003E	62	4		DVX	42												
00014	20	4		DVXG	28	1377	1379										
00042	66	4		DVY	43												
00018	24	4		DVYG	29												
00046	70	4		DVZ	44												
0001C	28	4		DVZG	30												
00320	800	2		D003	840	838											
00332	818	2		D005	849	839											
00338	824	2		D007	852	845											
0033E	830	2		D009	855	851											
00344	835	2		D010	859	857											
0034A	842	2		D011	862	858											
0034C	844	2		D015	863	880											
00360	864	2		D016	874	872											
00366	870	2		D017	877	873											
0036E	878	2		D020	881	879											
00378	888	2		D021	887	885											
00382	898	2		D022	892	888											
0038C	908	2		D023	897	886											
003E4	996	2		D030	943	939											
003F0	1008	2		D031	950	948											
003F2	1010	2		D032	951	949											
003FA	1018	2		D033	956	954											
003FC	1020	2		D034	957	955											
0041C	1052	2		D035	973	971											
00424	1060	2		D040	977	967	969	974									
0042A	1066	2		D050	980	930	965	972	976								
0047C	1148	2		D090	1021												
004C4	1220	2		D091	1057	1049											
004D8	1240	2		D092	1067	1059											
004EC	1260	2		D093	1077	1069											
00500	1280	2		D094	1087	1079											

XREF 1 DECK NAME=**TEXEC* SRC 2000 CROSS REFERENCE DICTIONARY PAGE 5

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES		
0051A	1306		2	D095	1100	1097		
0052C	1324		2	D096	1109	1105		
0052E	1326		2	D097	1110			
00536	1334		2	D098	1115	1113		
00054	84		1	D1	152	167		
00034	52		4	D1032	222	900	909	
0053C	1340		2	D100	1118	1102		
0053E	1342		2	D150	1119	1117		
0055C	1372		2	D151	1134	1130		
00566	1382		2	D155	1139	1122	1135	
0057A	1402		2	D157	1150	1143		
0057E	1406		2	D158	1152	1149		
0059E	1438		2	D160	1169	1156		
005A0	1440		2	D161	1170	1174		
005B4	1460		2	D163	1180	1178		
005D0	1488		2	D164A	1195	1183		
005B8	1464		2	D164	1183	1181		
005E6	1510		2	D165	1206	1182		
005E8	1512		2	D166	1207	1194	1205	
005EE	1518		2	D167	1210	1207		
005F8	1528		2	D170	1215	1211		
005FE	1534		2	D171	1220	1218		
0060A	1546		2	D180	1226	1221		
0061C	1564		2	D181	1235	1227		
00628	1576		2	D182	1241	1234		
00632	1586		2	D183	1246	1243		
0063E	1598		2	D184	1253	1248	1251	
00642	1602		2	D185	1255	1252		
0064E	1614		2	D186	1261	1256		
00654	1620		2	D240	1264	1219	1225	1260
00676	1654		2	D245	1281	1271	1277	
0067A	1658		2	D246	1284	1282		
0067E	1662		2	D247	1286	1283		
0069A	1690		2	D250	1300	1285		
006AE	1710		2	D251	1312	1310		
006BE	1726		2	D252A	1320	1317		
006C8	1736		2	D252B	1325	1322		
006B4	1716		2	D252	1315	1311		
006DC	1756		2	D254A	1335	1374		
006D2	1746		2	D254	1330	1314	1327	
006F0	1776		2	D255	1346	1344		
006FC	1788		2	D260	1353	1345		
00718	1816		2	D270	1367	1352		
0071E	1822		2	D271	1370	1351	1366	
00728	1832		2	D280	1375	1332	1373	
00738	1848		2	D290A	1383	1424		
00734	1844		2	D290	1381			
00750	1872		2	D291	1395	1392		
0075A	1882		2	D292	1400	1397		
0076E	1902		2	D293	1410	1406		
00778	1912		2	D294	1415	1411		
00782	1922		2	D295	1420	1417		
00038	56		4	D3032	223			

XREF 1 DECK NAME=*RTEXEC* SKC 2000 CROSS REFERENCE DICTIONARY PAGE 6

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES									
0079C	1932		2	D300	1425	1380	1423								
00798	1944		2	D301	1431	1427									
0079E	1950		2	D310	1434	1430									
00016	22		9	EIGHT	210										
00016	22		1	ERRCNT	322	513	615	617	660	682	684	721	723	743	745
07800	30720		3	EXEC	488										
00032	50		1	EXND	336	511	518	527	666	760					
07800	30720			EXORG	9	487									
07804	30724		3	EX00	490	494									
07814	30740		3	EX01	498	500									
07846	30790		3	EX30A	525	364									
07836	30774		3	EX30	517	529	668	762							
0784E	30795		3	EX70	530	531									
0009C	156		7	E1	154										
000A8	168		7	E2	155										
000B4	180		7	E3	156										
000C8	200		2	F	460	1054									
00006	214		2	FAILMS	471	679	714								
*****UNDEFINED*****				FENT		570									
000CA	202		2	FF	461	867	1030	1033	1161						
000D2	210		2	FFFD	465	1071									
000D4	212		2	FFFE	466	1081									
000CC	204		2	FFFF	462	1088									
000D0	208		2	FF0F	464	1092									
000DC	220		2	FF3F	470	1188	1199								
000EC	236		2	FGIZER	479	658	758								
0001E	30		9	FONE	214	1410									
00010	16		9	FOUR	207	555	561	586							
000CE	206		2	F00F	463	1061									
000AE	174		2	F304	447	1388									
00012	18		2	GASCUM	369	811									
*****UNDEFINED*****				GASC		369									
0002C	44		4	GMT	34	898	899	901	902						
00034	52		1	GSCT	337	843	846	850							
00024	36		1	HCTM	329										
00050	80		4	HDGV	48	1159									
00110	272		9	HEDL	280	281	1312								
000C4	196		2	HEDMSK	458	1156									
00010	16		11	HOLD	181										
00218	536			IMSK	11	509									
000BE	190		2	IMUMSK	455	1001									
07FA0	32672			INTORG	10	15									
0022C	556		2	INT04	708	17									
001EA	490		2	INT05	673	18									
00158	344		2	INT10	594	20									
00060	96		4	ITER	54	519	913	918	920	1281					
000B4	180		2	ITRMSK	450										
00176	374		2	I10END	610	662	667	670							
06FF4	28660		10	I13	354	1045									
06FFC	28668		10	I2C	358	1304									
06FF0	28656		10	I21	352	1005	1010	1014							
06FF2	28658		10	I22	353	984	1019								
06FF8	28664		10	I24	356	1300									

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES							
06FFA	28666	10	125		357	1302						
06FF6	28662	10	I3F		355	573	801	921	923			
00242	674	2	I4END		768	729	764					
00252	594	2	I4EOT		727	715						
0026C	620	2	I4EOT1		740	735						
00278	632	2	I4EOT2		746	739						
0029C	664	2	I4EXNO		765	761						
06FE0	28640	10	I4F		343	855						
00224	548	2	I5END		702	695						
00212	530	2	I5EOT		693	680						
06FE2	28642	10	I71		345	1383						
06FE4	28644	10	I72		346							
06FE6	28646	10	I73		347	1000						
06FE8	28648	10	I74		348	995						
06FEA	28650	10	I75		349	1025	1032	1041				
06FEC	28652	10	I76		350	1021	1029	1037				
06FEE	28654	10	I77		351	980	989	991				
0000C	12	2	JDUMY		366	497						
000E4	228	7	J3X3		165							
0002C	44	9	KGUL		220							
00026	38	2	KLIT		379	796						
004E	78	7	KSN1		149							
00050	80	7	KSN2		150							
00052	82	7	KSN3		151							
00150	336	7	K3X3		166							
00024	36	7	LCA1		158							
00028	40	7	LCA4		159							
00022	34	11	LHED		189	1313	1319					
00004	4	2	LITCO4		362							
0006E	110	4	LITE		61	797	958	960	978	979		
00024	36	11	LPCH		190	1324						
00012	18	11	LPTK		182	827	829	840	842			
00026	38	11	LROL		191	1329						
00054	84	7	L3X3		167							
00026	38	1	MALF		330							
0001A	26	11	MASK		186							
00000	0	7	MATCO4		129							
00028	40	1	MLFN		331							
0006C	108	4	MODE		60	554	560	576	587	590	804	964	975
000B0	176	2	MSHMSK		448	837						
0FF7F	65407		MSK		8	1362	1364					
000E8	232	2	MSK1		477	690	716					
000EA	234	2	MSK2		478	691	718					
00064	100	4	NAVF		56							
00004	4	9	NFOUR		201							
00018	24	9	NINE		211							
0002C	44	7	NMO		140							
00008	8	9	NONE		203	512	834	1107				
07844	30788	3	NORSET		524	521						
0017E	382	2	NOTRED		614	597						
00193	403	2	NRD1		625	621						
0019E	414	2	NRD2		631	627						
001A8	424	2	NRD3		636	632						

XREF 1 DECK NAME=*RTEXEC* SKC 2000 CROSS REFERENCE DICTIONARY PAGE 8

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
001C2	450		2	NRD4	650	652											
001DA	474		2	NRD5	663	661											
00006	6		9	NTWO	202												
00000	0		9	N64	198												
000C0	192		7	OC	157												
000DA	218		2	OFFF	469	1051											
000D6	214		2	OFFO	467	471	1064										
00014	20		11	OMAX	196												
00028	40		9	OMEG	219												
00024	36		9	OMGA	218												
0000A	10		9	ONE	204	517	557	568	614	681	720	766	841	847	860	875	1108
						1192	1203	1265	1268	1432							
00020	32		9	ONMLF	217	1289	1296										
000D8	216		2	OOFF	468	985	1015	1022	1026	1038	1042						
000C6	198		2	OOO6	459	1223											
000AC	172		4	O14	93	799	1091	1094	1187	1190	1198	1201					
00094	148		4	O18	81												
000A4	164		4	O21	89												
000A6	166		4	O22	90												
000A2	162		4	O23	88												
000A8	168		4	O24	91												
000CA	202		4	O25	108	600	1016	1125									
00096	150		4	O30	82												
00098	152		4	O31	83												
0009A	154		4	O32	84												
0009C	156		4	O33	85												
0009E	158		4	O34	86												
000A0	160		4	O35	87												
00086	134		4	O4A	74												
00088	136		4	O4B	75												
0008A	138		4	O4C	76												
000B2	178		4	O4D	96	990	1110										
000B4	180		4	O4E	97	988	1103	1164									
00072	114		4	O4F	64	856	914	917									
00074	116		4	O40	65	906											
00076	118		4	O41	66	904											
00078	120		4	O42	67												
0007A	122		4	O43	68												
0007C	124		4	O44	69												
0007E	126		4	O45	70												
000BC	140		4	O46	77												
00080	128		4	O47	71												
00082	130		4	O48	72												
00084	132		4	O49	73												
000D2	210		4	O5A	112												
000C4	196		4	O5B	105	564	927	931	943	946							
000C6	198		4	O5D	106	882	1009	1053	1063	1073	1083						
000C8	200		4	O5E	107	1046	1098										
000B6	182		4	O5O	98	1028	1336	1339									
000B8	184		4	O51	99	1036											
000BA	186		4	O52	100	1044											
000BC	188		4	O53	101	1384											
000BE	190		4	O54	102												

XREF 1 DECK NAME=*RTEXEC* SRC 2000 CROSS REFERENCE DICTIONARY PAGE 9

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES					
000C0	192	4		055	103						
000C2	194	4		056	104						
000C6	214	4		057	114						
000C8	215	4		058	115						
000CA	214	4		059	115						
000EA	234	4		05A	124						
000EC	235	4		05B	125						
000BE	142	4		05C	78	1301	1318				
00090	144	4		05D	79	1303	1323				
00092	146	4		05E	80	1305	1328				
000CC	204	4		050	109	1020	1157	1160			
000D4	212	4		052	113						
000DC	220	4		053	117						
000DE	222	4		054	118						
000E0	224	4		055	119						
000E2	225	4		056	120						
000E4	226	4		057	121						
000E5	230	4		058	122						
000E8	232	4		059	123						
00060	176	4		071	95	830					
000AE	174	4		072	94	831					
000E6	230	2		ACCRST	476	505	637	653	746		
00062	98	4		AMAS	55						
000E2	225	2		AICC1	474	600					
000E4	226	2		AICC2	475	696					
07FCA	32712			AICOUT	3						
000F2	242	2		AIC2	482	646	753				
000F4	244	2		AIC3	483	645	755				
000DE	222	2		AOCC1	472	598					
000E0	224	2		AOCC2	473	642					
000EE	238	2		AOC1	480	644	749				
000F0	240	2		AOC2	481	640	655	751			
00068	104	4		AUSM	58	950					
0003A	34	4		BAT	40	1115	1179	1180			
0003C	60	4		BATL	41	1191	1193	1202	1204	1206	1209
00086	182	2		BATMS1	451	981					
00088	184	2		BATMS2	452	1165					
0008A	186	2		BATMS3	453	1106					
00008	8	4		BATM	24	1195	1196	1197			
0000C	12	4		BATP	25	1184	1185	1186			
00014	20	7		BES1	135	1393	1398	1400	1403	1405	
00018	24	7		BES2	136						
0001C	28	7		BES3	137						
00020	32	7		BES4	138						
07FEA	32744			BET04	4	763	771				
07FEA	32745			BET05	5	705					
07FF4	32750			BET10	6	613	669				
00000	0	2		BMAX	360	1250					
00002	2	2		BMIN	361	1246					
00038	56	1		BOTH	339	1119	1215	1230	1237		
00010	16	4		BOT1	26	1228	1232	1256	1286		
00012	18	4		BOT2	27	1235	1239	1262	1293		
07A0A	30730	3		BTNCLR	493	490					

XREF 1 DECK NAME=*RTEXEC* SKC 2000 CROSS REFERENCE DICTIONARY PAGE 10

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
07FE0	32736			RTNORG	1	491	492										
00034	52		4	R1CT	37	1259	1264	1266	1275								
00036	54		4	R2CT	38	1263	1267	1269									
00108	264		7	SA	159												
06FE0	28640			SDLORG	13	342											
00014	20		9	SEVEN	209	520	575	803	962								
00008	8		7	SGDL	132	170											
06FE2	28642		10	SIDL	344	866											
00012	18		9	SIX	208												
00008	8		7	SL	170												
00028	40		2	SDDLIN	380	814											
00072	114		4	SDDL	63	815	869										
00000	0		11	SPEXMC	172												
00014	20		2	SPINJM	370	807											
*****UNDEFINED*****				SPIN		370											
00024	36		7	SRA	139	168	169										
00000	0		4	SRT1	22	789	1290	1291	1292								
00004	4		4	SRT2	23	1297	1298	1299									
00082	178		2	SWMSK	449	924											
00000	0		7	SWT	130												
0003E	62		7	S1	145												
000AC	172		2	S1A32	446	844											
00042	66		7	S2	146												
00046	70		7	S3	147												
0004A	74		7	S4	148												
0003A	58		1	TDVX	340	1359	1360	1378									
03FFE	16382			TEMCOR	7	495											
00016	22		11	TEMP2	184	826	848	849	1233	1240	1244	1341	1350	1401	1404		
00018	24		11	TEMP4	185	1356	1361	1407	1409								
00014	20		11	TEMP	183	196	833	836	868	871	934	938	983	987	994	998	999
						1003	1004	1008	1013	1017	1024	1027	1031	1035	1040	1043	1090
						1093	1124	1128	1131	1133	1229	1236	1241	1245	1247	1249	1254
						1257	1261	1338	1342	1349	1354	1355	1389	1394	1399	1402	
000BC	188		2	TEMSK	454	996											
0001A	26		9	TEN	212												
0006A	106		4	TEST	59	945											
0000E	14		9	THREE	206	589	1220										
000C2	194		2	THTY	457	1089											
00058	88		4	TIME	52	907	908	910	911								
*****UNDEFINED*****				TKTH		1434											
0012C	300		7	TM	166												
00070	112		4	TMPR	62	952	973										
00150	336		7	TM1	161	163	164	166									
*****UNDEFINED*****				TORK		701											
07FA8	32680		0	TRP04	17												
07FAA	32682		0	TRP05	18												
07FB4	32692		0	TRP10	20												
0000C	12		9	TWO	205	522	664	887									
0005C	92		4	TX	53												
*****UNDEFINED*****				VECADD		1375											
00004	4		2	VECJMP	364	501											
00174	372		7	VECT	182	498	502	524	542	806	808	810	812				
0004C	76		4	VRTV	46	1168	1171										

XREF .1 DECK NAME=*RTEXEC* SRC 2000 CROSS REFERENCE DICTIONARY PAGE 11

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES
00000	0	4		*LDCOM	21
0001C	28	9		ZERO	213 215 488 510 538 777 787 798 824 881 895 1110 1118 1132 1145 1175 1208 1287 1294 1335 1357 1408 1428